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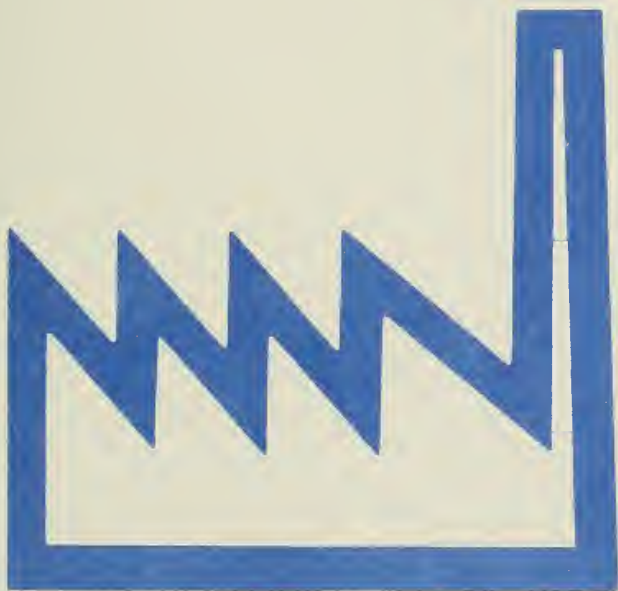
Census of Manufactures

MC87-I-35C

INDUSTRY SERIES

Metalworking Machinery and Equipment

Industries 3541, 3542, 3543, 3544, 3545,
3546, 3547, 3548, and 3549



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If you have any questions concerning the statistics in this report, call (301) 763-7304.

1987

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INTRODUCTION

PURPOSE AND USES OF THE ECONOMIC CENSUSES

The economic censuses are the major source of facts about the structure and functioning of the Nation's economy. They provide essential information for government, business, industry, and the general public.

Economic censuses furnish an important part of the framework for such composite measures as the gross national product, input-output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.

Policy-making agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.

State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.

Trade associations study trends in their own and competing industries, and keep their members informed of market changes.

Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic censuses every 5 years, covering years ending in 2 and 7. The 1987 Economic Censuses consist of the

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Transportation
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1987 Census of Agriculture and 1987 Census of Governments are conducted separately.) The next economic censuses are scheduled to be taken in 1993 covering the year 1992.

AVAILABILITY OF THE DATA

The results of each of the economic censuses are available in printed reports, for sale by the U.S. Government Printing Office, and on microfiche, computer tape, compact discs with read-only memory, and flexible diskettes, for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Census Bureau, Washington, DC 20233. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State Data Centers in every State and Business and Industry Data Centers in many States also supply economic census statistics.

WHAT'S NEW IN 1987

Several changes have taken place for the 1987 censuses. Data will be reported on the basis of the newly revised Standard Industrial Classification (SIC) system with selected reports including "bridge tables," linking the old and new classification systems. A new set of metropolitan areas has been adopted, and more detailed information will be available for businesses with no paid employees. For additional information on these changes, review the subsequent text.

HISTORICAL INFORMATION

The economic censuses have been taken together as an integrated program at 5-year intervals since 1967, and before that for 1963, 1958, and 1954. Prior to that time, the individual censuses were taken separately at varying intervals.

The economic censuses trace their beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial

activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 manufactures census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade, and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 economic censuses were the first to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. These were the first censuses to be taken by mail, using lists of firms provided by the administrative records of other federal agencies. Since 1963, administrative records have also been used to provide basic statistics as well for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic censuses, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The Census of Construction Industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The Census of Transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks. New for 1987 are publications reporting on business establishments engaged in several transportation industries, paralleling the data on establishments in other sectors. This is part of a gradual expansion in coverage of industries previously subjected to government regulation. The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic censuses in 1972 along with the Survey of Women-Owned Businesses.

Economic censuses have also been taken in Puerto Rico since 1909, in the Virgin Islands and Guam since 1958, and in the Northern Mariana Islands since 1982.

Statistical reports from the 1982 and earlier censuses provide historical figures for the study of long-term time series, and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the censuses provide complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, the results of which appear in publication series such as *Current Business Reports* (retail and wholesale trade and service industries), the *Annual Survey of Manufactures*, *Current Industrial Reports*, and the *Quarterly Financial Report*. Most of these surveys, while providing more frequent

observations, yield less kind-of-business and geographic detail than the censuses. The *County Business Patterns* program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1987 Economic Censuses and Related Statistics*. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1987 Economic Censuses*. Contact Customer Services for information on availability.

CENSUS OF MANUFACTURES

General

This report, from the 1987 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as type of organization, distribution of sales by class of customer, concentration ratios and water use in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan statistical areas (MSA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MSA's with 250 employees or more and for counties and places with 450 employees or more.

The *General Summary* report will contain industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text will discuss the relationship of value added by manufacture to National income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

Scope of Census and Definition of Manufacturing

The 1987 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial*

*Classification (SIC) Manual*¹. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

Relationship Between Annual Survey of Manufactures and Census of Manufactures

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 56,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in

distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1987, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

Manufacturing Universe and Census Report Forms

The 1987 Census of Manufactures universe includes approximately 350,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. Small Single-Establishment Companies Not Sent a Report Form

In the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than five employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

¹Standard Industrial Classification Manual: 1987: For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock No. 041-001-00314-2.

were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-record cases were only given a two- or three-digit SIC group. For the 1987 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. Establishments Sent a Report Form

The 200,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments**—This group consisted of approximately 56,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see appendix, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is one of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM)**—Approximately 84,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive one of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.
- c. **Small single-establishment companies (non-ASM)**—This group consisted of approximately 60,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received one of the approximately 80 versions of the short form, which requested

summary product and material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

Auxiliaries

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 10,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1987 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include (1) program planning, including sales research and coordination of purchasing, production, and distribution; (2) company purchasing, including general contracts and purchasing methods; (3) company financial policy and accounting; (4) general engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations; (5) direction of company personnel matters; and (6) legal and patent matters.

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

Industry Classification of Establishments

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1987, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see appendix, Annual Survey of Manufactures).

However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The result of these rules covering the switching of plants from one industry classification to another is that, at the aggregate level, some industries comprise different mixes of establishments between survey years, and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-record cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all

carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

Value of Shipments for the Industry Compared With Value of Product Shipments

This report shows value of shipments data for industries and products. In tables 1a through 5a, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed. However, the suppressed data are included in higher-level totals. Additional disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1987 Census of Manufactures may be obtained on computer tape or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential

information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Industry Division, Bureau of the Census, Washington, DC 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

–	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards.
(X)	Not applicable.
(Z)	Less than half the unit shown.
do	Ditto.

n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

CONTACTS FOR DATA USERS

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Census/ASM		
Durables	Kenneth Hansen	(301) 763-7304
Nondurables	Michael Zampogna	(301) 763-2510
Current Industrial Reports		
Durables	Malcolm Bernhardt	(301) 763-2518
Nondurables	Thomas Flood	(301) 763-5911
Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

Users' Guide for Locating Statistics in This Report by Table Number

For explanation of terms, see appendixes

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operating ratios	By geographic area	Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class
Number of companies	1a			3a					*6a		
Number of establishments . . .	1a		2	3a	4	5a					
Employment and payroll:											
Number of employees	1a	1b	2	3a	4	5a					
Payroll	1a	1b	2	3a	4	5a					
Supplemental labor costs . . .				3a							
Production workers	1a	1b	2	3a	4	5a					
Production- worker hours . . .	1a	1b	2	3a	4	5a					
Production- worker wages . . .	1a	1b	2	3a	4	5a					
Shipments, cost of materials, and value added:											
Value of shipments (four-digit)	1a	1b	2	3a	4	5a		5b			
Product class shipments (five-digits)									6a	6b	6c
Product shipments (seven-digit)									6a		
Value added by manufacture	1a	1b	2	3a	4	5a					
Cost of materials	1a	1b	2	3a	4	5a					
Fuels and electric energy . . .				3a							
Materials consumed by kind . . .							7				
Inventories:											
Total, end of year	1a			3a	4						
By stage of fabrication				3a							
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures . . .	1a		2	3b	4	5a					
Used plant and equipment expenditures				3b							
Gross assets				3b							
Depreciation				3b							
Retirements of buildings and machinery				3b							
Rental payments				3b							
Foreign content of materials consumed				3c							
Purchased services				3c							
Ratios:											
Specialization	1a			3a				5b			
Coverage	1a			3a				5b			

*Number of companies with shipments of more than \$100 thousand.

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DESCRIPTION OF INDUSTRIES AND SUMMARY OF FINDINGS

This report shows 1987 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC code and title

3541	Machine Tools, Metal Cutting Types
3542	Machine Tools, Metal Forming Types
3543	Industrial Patterns
3544	Special Dies, Tools, Jigs, and Fixtures
3545	Machine Tool Accessories
3546	Power-Driven Handtools
3547	Rolling Mill Machinery
3548	Welding Apparatus
3549	Metalworking Machinery, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account when comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Small single-establishment companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. For these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated), data on payrolls and receipts were obtained from administrative records of other Federal agencies. The remaining statistics were developed from industry averages.

Establishment data were tabulated based on industry definitions included in the 1987 Standard Industrial Classification (SIC) Manual¹. The 1987 edition represents a major revision for manufacturing industries from the 1972

edition and its 1977 supplement. In addition to the 1987 SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The product class and product code comparability between the 1987 and 1982 censuses is shown in the appendixes. These appendixes present, in tabular form, the linkage from 1987 to 1982.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES

This industry is made up of establishments primarily engaged in manufacturing metal cutting type machine tools, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques; the rebuilding of such machine tools, and the manufacture of replacement parts for them. Also included in this industry are metalworking machine tools designed primarily for home workshops. Establishments primarily engaged in the manufacture of electric and gas welding and soldering equipment are classified in industry 3548, and those manufacturing portable power-driven handtools are classified in industry 3546. Products of this industry also are collected in the Current Industrial Report MQ-35W, Metalworking Machinery.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3541, Machine Tools, Metal Cutting Types, had employment of 31.7 thousand. The employment figure was 46 percent below the 58.3 thousand reported in 1982. Compared with 1986, employment decreased 18 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Ohio, Michigan, Illinois, and New York, accounting for 54 percent of the industry's employment. This represents a shift from 1982 when Ohio, Michigan, Illinois, and Connecticut accounted for 55 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$3.2 billion.

¹Standard Industrial Classification Manual: 1987. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3541 shipped \$2.4 billion of metal cutting machine tools products considered primary to the industry, \$484.8 million of secondary products, and had \$310.6 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 83 percent (specialization ratio). In 1982, the specialization ratio was 91 percent.

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio also was 93 percent. The products primary to industry 3541, no matter in what industry they were produced, appear in table 6a and aggregate to \$2.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the machine tools, metal cutting types, industry amounted to \$1.4 billion. Data on specific materials consumed appear in table 7.

The data for a small number of establishments whose reports were not received at the time the data were tabulated were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of total value of shipments. For 1987, there were no small nonmail establishments for which administrative records were used.

INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES

This industry is made up of establishments primarily engaged in manufacturing metal forming machine tools, not supported in the hands of an operator while in use, for pressing, hammering, extruding, shearing, die-casting, or otherwise forming metal into shape. This industry also includes the rebuilding of such machine tools and the manufacture of repair parts for them. Establishments primarily engaged in the manufacture of electric and gas welding equipment and soldering equipment are classified in industry 3548; those manufacturing portable power-driven handtools are classified in industry 3546; and those manufacturing rolling mill machinery and equipment are classified in industry 3547. Products of this industry also are collected in the Current Industrial Report MQ-35W, Metalworking Machinery.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3542, Machine Tools, Metal Forming Types, had employment of 13.8 thousand. The employment figure was 29 percent

below the 19.5 thousand reported in 1982. Compared with 1986, employment decreased 17 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Illinois, Ohio, Michigan, and New York, accounting for 68 percent of the industry's employment. These same States were the leaders in 1982, when they accounted for 62 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$1.4 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3542 shipped \$1.2 billion of metal forming machine tools products considered primary to the industry, \$116.7 million of secondary products, and had \$93.5 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 91 percent (specialization ratio). In 1982, the specialization ratio was 89 percent.

Establishments in this industry also accounted for 87 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio also was 87 percent. The products primary to industry 3542, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.4 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the machine tools, metal forming types, industry amounted to \$637.8 million. Data on specific materials consumed appear in table 7.

The data for a small number of establishments whose reports were not received at the time the data were tabulated were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 10 percent of total value of shipments. For 1987, there were no small nonmail establishments for which administrative records were used.

INDUSTRY 3543, INDUSTRIAL PATTERNS

This industry is made up of establishments primarily engaged in manufacturing industrial patterns.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. However, the industry SIC number has been changed from 3565 to 3543.

In the 1987 Census of Manufactures, Industry 3543, Industrial Patterns, had employment of 8.6 thousand. The employment figure was 12 percent below the 9.8 thousand reported in 1982. Compared with 1986, employment increased

25 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Michigan, Ohio, Wisconsin, and Tennessee. This represents a shift from 1982 when Michigan, Ohio, Pennsylvania, and Illinois were the leading States.

The total value of shipments for establishments classified in this industry was \$499.4 million.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3543 shipped \$445.0 million of industrial patterns products considered primary to the industry, \$36.5 million of secondary products, and had \$17.9 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 92 percent (specialization ratio). In 1982, the specialization ratio was 97 percent.

Establishments in this industry also accounted for 80 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 76 percent. The products primary to industry 3543, no matter in what industry they were produced, appear in table 6a and aggregate to \$557.9 million. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the industrial patterns industry amounted to \$112.5 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 5 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 19 percent of total value of shipments.

INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES

This industry includes establishments commonly known as contract tool and die shops and primarily engaged in manufacturing, on a job or order basis, special tools and fixtures for use with machine tools, hammers, die-casting machines, and presses. The products of establishments classified in this industry include a wide variety of special toolings, such as dies; punches; diesets and components and sub-presses; jigs and fixtures; and special checking devices. Establishments primarily engaged in manufacturing molds for die-casting and foundry casting; metal molds for plaster working, rubber working, plastics working, glass

working and similar machinery are also included. Establishments primarily engaged in manufacturing molds for heavy steel ingots are classified in industry 3321, and those manufacturing cutting dies, except metal cutting, are classified in industry 3423.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3544, Special Dies, Tools, Jigs, and Fixtures, had employment of 114.4 thousand. The employment figure was 11 percent above the 102.9 thousand reported in 1982. Compared with 1986, employment increased 5 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Michigan, Ohio, Illinois, and Pennsylvania, accounting for 54 percent of the industry's employment. These same States were the leaders in 1982 when they accounted for 53 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$7.6 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3544 shipped \$6.7 billion of special dies, tools, jigs, and fixtures products considered primary to the industry, \$418.8 million of secondary products, and had \$453.2 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 94 percent (specialization ratio). In 1982, the specialization ratio also was 94 percent.

Establishments in this industry also accounted for 82 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 79 percent. The products primary to industry 3544, no matter in what industry they were produced, appear in table 6a and aggregate to \$8.1 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the special dies, tools, jigs, and fixtures industry amounted to \$2.2 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 5 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 15 percent of total value of shipments.

INDUSTRY 3545, MACHINE TOOL ACCESSORIES

This industry is made up of establishments primarily engaged in manufacturing cutting tools, machinists' precision measuring tools, and attachments and accessories for machine tools and for other metalworking machinery, not elsewhere classified. Establishments primarily engaged in manufacturing handtools, except power-driven types, are classified in industry group 342.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3545, Machine Tool Accessories, had employment of 48.4 thousand. The employment figure was 12 percent below the 55.1 thousand reported in 1982. The leading States in employment in 1987 were Michigan, Ohio, Illinois, and Massachusetts, accounting for 49 percent of the industry's employment. These same States were the leaders in 1982, when they accounted for 54 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$3.6 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3545 shipped \$3.2 billion of machine tool accessories products considered primary to the industry, \$211.2 million of secondary products, and had \$220.8 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 94 percent (specialization ratio). In 1982, the specialization ratio was 92 percent.

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 89 percent. The products primary to industry 3545, no matter in what industry they were produced, appear in table 6a and aggregate to \$3.4 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the machine tool accessories industry amounted to \$1.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 15 percent of total value of shipments.

INDUSTRY 3546, POWER-DRIVEN HANDTOOLS

This industry is made up of establishments primarily engaged in manufacturing power-driven handtools, such as drills and drilling tools, pneumatic and snagging grinders, and electric hammers. Establishments primarily engaged in manufacturing metal cutting type and metal forming type machines (including home workshop tools) which are not supported in the hands of an operator are classified in industries 3541 and 3542; and those primarily manufacturing power-driven heavy construction or mining handtools are classified in industry group 353.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3546, Power-Driven Handtools, had employment of 16.8 thousand. The employment figure was 22 percent below the 21.6 thousand reported in 1982. Compared with 1986, employment decreased 6 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were North Carolina, Arkansas, Tennessee, and Arizona. This represents a shift from 1982 when North Carolina, South Carolina, Ohio, and Maryland were the leading States.

The total value of shipments for establishments classified in this industry was \$2.2 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3546 shipped \$1.6 billion of power-driven handtools products considered primary to the industry, \$335.6 million of secondary products, and had \$216.6 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 83 percent (specialization ratio). In 1982, the specialization ratio was 88 percent.

Establishments in this industry also accounted for 85 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 91 percent. The products primary to industry 3546, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.9 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the power-driven handtools industry amounted to \$1.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were

obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of total value of shipments.

INDUSTRY 3547, ROLLING MILL MACHINERY

This industry is made up of establishments primarily engaged in manufacturing rolling mill machinery and processing equipment for metal production, such as cold forming mills, structural mills, and finishing equipment.

The 1987 definition of this industry is the same as that used in the 1972/7 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1987 Census of Manufactures, Industry 3547, Rolling Mill Machinery, had employment of 3.9 thousand. The employment figure was 24 percent below the 5.1 thousand reported in 1982. Compared with 1986, employment increased 11 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses. The leading States in employment in 1987 were Ohio, Pennsylvania, Massachusetts, and Indiana. This represents a shift from 1982 when Pennsylvania, Ohio, Massachusetts, and California were the leading States.

The total value of shipments for establishments classified in this industry was \$467.8 million.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3547 shipped \$378.0 million of rolling mill machinery products considered primary to the industry, \$32.3 million of secondary products, and had \$57.5 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 92 percent (specialization ratio). In 1982, the specialization ratio was 79 percent.

Establishments in this industry also accounted for 94 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). In 1982, the coverage ratio was 79 percent. The products primary to industry 3547, no matter in what industry they were produced, appear in table 6a and aggregate to \$403.0 million. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the rolling mill machinery industry amounted to \$249.7 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were

obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of total value of shipments.

INDUSTRY 3548, WELDING APPARATUS

This industry is made up of establishments primarily engaged in manufacturing electric and gas welding and soldering equipment and accessories. Also included are establishments primarily engaged in coating welding wire from purchased wire or from wire drawn in the same establishment. Establishments primarily engaged in manufacturing handheld soldering irons are classified in industry 3423, and those manufacturing electron beam, ultrasonic, and laser welding equipment are classified in industry 3699.

Industry 3548, Welding Apparatus, is a combination of 1972 SIC-based industry 3623 and 1972 SIC-based product classes 35495 pt., 35496, and 35497 pt. The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3548, Welding Apparatus, had employment of 18.7 thousand. The leading States in employment in 1987 were Ohio, Michigan, Wisconsin, and Pennsylvania.

The total value of shipments for establishments classified in this industry was \$2.1 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3548 shipped \$1.8 billion of welding apparatus products considered primary to the industry, \$200.1 million of secondary products, and had \$132.2 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 90 percent (specialization ratio).

Establishments in this industry also accounted for 92 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3548, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.9 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the welding apparatus industry amounted to \$1.1 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were

not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 9 percent of total value of shipments.

INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing metalworking machinery, not elsewhere classified. Establishments primarily engaged in manufacturing automotive maintenance equipment are classified in industry 3559.

The 1987 definition of this industry has been revised from that used in the 1972 Standard Industrial Classification (SIC) manual. However, the SIC number and title are unchanged. 1972 SIC-based industry 3549 was split into two separate new industries: Welding Apparatus (SIC 3548) and Metalworking Machinery, N.E.C. (SIC 3549). The effect of the revisions on the data is summarized in tables 1c-1 and 1c-2. During the 1987 processing, each establishment was classified according to both the old and new SIC. Table 1c-1 shows the distribution of the new industry among the old SIC classifications. Table 1c-2 shows the distribution of the old SIC-based industries among the new SIC classifications.

In the 1987 Census of Manufactures, Industry 3549, Metalworking Machinery, N.E.C., had employment of 11.5 thousand. The leading States in employment in 1987 were Michigan, Illinois, Wisconsin, and Ohio, accounting for 53 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$1.1 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry to which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3549 shipped \$898.8 million of metalworking machinery, n.e.c., products considered primary to the industry, \$112.7 million of secondary products, and had \$43.6 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in the industry was 89 percent (specialization ratio).

Establishments in this industry also accounted for 88 percent of products considered primary to the industry no matter where they actually were produced (coverage ratio). The products primary to industry 3549, no matter in what industry they were produced, appear in table 6a and aggregate to \$1.0 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and electric energy used by establishments classified in the metalworking machinery, n.e.c., industry amounted to \$451.6 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with up to 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 15 percent of total value of shipments.

Table 1a-1. Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years

[Industries with only 1987 data are revised for 1987. Table 1a-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	Companies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufac- ture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expendi- tures ⁶ (million dollars)	End-of- year inven- tories ⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Special- ization ⁷ (per- cent)	Cover- age ⁸ (per- cent)
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES															
1987 Census	9381	9417	232	31.7	921.5	18.2	35.4	465.7	1 668.7	1 399.5	3 189.5	61.1	1 056.8	83	93
1986 ASM	(NA)	(NA)	(NA)	38.6	1 088.8	22.0	43.6	557.0	1 823.8	1 538.0	3 456.1	62.7	1 215.6	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	42.8	1 127.6	24.9	47.7	592.6	2 000.0	1 471.6	3 377.0	91.6	1 349.7	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	42.4	1 053.9	24.7	46.5	541.7	1 820.0	1 369.5	3 211.6	108.8	1 196.5	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	43.0	997.1	24.5	45.9	512.1	1 612.7	1 100.0	2 880.9	104.8	1 281.6	(NA)	(NA)
1982 Census	865	942	293	58.3	1 335.0	33.9	63.6	709.2	2 516.2	1 598.3	4 411.5	157.7	1 435.5	91	93
1981 ASM	(NA)	(NA)	(NA)	74.3	1 633.0	47.9	98.5	964.1	3 739.9	2 187.3	5 865.3	233.2	1 485.5	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	72.8	1 504.0	47.8	98.8	889.5	3 349.2	2 026.1	5 227.6	171.6	1 419.4	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	69.1	1 304.1	45.7	95.9	786.9	2 833.8	1 736.9	4 389.0	147.6	1 242.2	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	64.3	1 120.7	42.2	88.2	679.6	2 267.0	1 417.7	3 611.8	102.0	1 012.3	(NA)	(NA)
1977 Census	872	917	306	59.4	949.0	37.2	76.3	540.7	1 866.1	1 047.7	2 812.7	80.4	877.9	87	92
1976 ASM	(NA)	(NA)	(NA)	58.1	845.4	37.6	73.5	473.9	1 664.1	852.3	2 496.2	65.2	735.4	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	62.8	850.3	40.8	81.7	486.8	1 640.3	1 050.3	2 727.8	52.2	737.9	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	65.0	874.4	43.9	92.5	509.8	1 617.0	1 017.9	2 480.5	58.9	786.2	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	59.9	709.4	39.8	83.3	417.9	1 214.1	764.1	1 891.1	38.4	591.9	(NA)	(NA)
1972 Census	857	894	275	52.5	573.8	33.4	68.2	325.9	901.7	536.3	1 418.1	35.2	482.2	86	90
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES															
1987 Census	9196	9207	120	13.8	414.3	8.7	18.1	236.7	734.3	637.8	1 396.3	31.2	529.3	91	87
1986 ASM	(NA)	(NA)	(NA)	16.6	440.5	10.7	21.4	257.3	765.7	713.2	1 507.9	33.9	524.2	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	17.7	461.6	11.5	23.0	275.4	933.2	598.7	1 412.8	43.7	569.3	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	16.1	407.0	10.5	20.7	242.7	775.9	535.4	1 308.7	31.0	424.0	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	15.3	357.0	9.6	17.8	196.0	629.6	454.9	1 142.3	102.1	431.6	(NA)	(NA)
1982 Census	435	452	162	19.5	438.1	12.1	23.2	245.3	777.8	574.6	1 428.7	43.4	511.5	89	87
1981 ASM	(NA)	(NA)	(NA)	24.0	496.8	16.0	30.8	294.9	976.5	662.7	1 615.7	63.0	479.7	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	26.9	514.1	18.2	35.2	313.2	1 042.1	718.5	1 753.1	69.4	455.2	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	27.0	485.6	18.7	37.5	305.1	1 004.0	687.0	1 663.5	58.1	447.0	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	25.2	415.6	17.0	35.1	253.2	841.3	576.4	1 366.0	40.4	421.7	(NA)	(NA)
1977 Census	411	426	163	23.7	360.7	16.1	32.8	219.4	721.9	444.0	1 130.6	24.7	359.6	90	87
1976 ASM	(NA)	(NA)	(NA)	22.9	336.8	15.9	32.0	214.2	621.1	433.9	1 070.7	28.3	312.9	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	26.0	343.1	17.7	35.8	208.2	618.3	483.2	1 106.6	23.9	362.5	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	29.0	370.8	20.3	43.3	238.2	633.7	505.4	1 099.3	34.4	363.8	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	27.0	323.6	18.9	41.8	205.1	546.5	370.8	886.2	27.5	293.8	(NA)	(NA)
1972 Census	375	383	162	24.1	265.4	16.6	34.7	163.8	417.7	285.3	696.3	17.5	242.7	89	87
INDUSTRY 3543, INDUSTRIAL PATTERNS ¹¹															
1987 Census	812	813	85	8.6	237.5	6.9	13.8	186.4	389.3	112.5	499.4	18.5	43.0	92	80
1986 ASM ¹²	(NA)	(NA)	(NA)	6.9	191.7	5.8	12.3	155.3	384.9	216.8	590.4	14.1	43.6	(NA)	(NA)
1985 ASM ¹²	(NA)	(NA)	(NA)	7.1	188.1	6.0	12.0	152.6	349.0	216.1	549.3	15.6	60.4	(NA)	(NA)
1984 ASM ¹²	(NA)	(NA)	(NA)	7.0	173.7	5.8	11.1	137.0	312.2	186.3	461.1	11.4	45.5	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	10.2	218.9	8.3	14.9	177.2	311.8	112.2	417.2	104.4	32.9	(NA)	(NA)
1982 Census	994	996	105	9.8	217.6	8.1	14.8	173.4	347.6	97.6	452.3	15.8	29.6	97	76
1981 ASM ¹²	(NA)	(NA)	(NA)	9.2	216.6	7.4	13.8	170.0	349.0	103.0	453.3	12.3	37.2	(NA)	(NA)
1980 ASM ¹²	(NA)	(NA)	(NA)	9.6	183.1	7.6	13.5	145.3	310.7	113.8	415.2	(S)	35.8	(NA)	(NA)
1979 ASM ¹²	(NA)	(NA)	(NA)	9.9	184.3	8.5	15.0	145.7	302.3	103.9	399.5	10.8	31.2	(NA)	(NA)
1978 ASM ¹²	(NA)	(NA)	(NA)	9.4	167.0	8.0	15.5	130.1	268.6	73.8	335.6	17.1	30.1	(NA)	(NA)
1977 Census	1 001	1 002	115	9.3	152.7	8.0	15.8	122.2	252.5	72.0	320.6	11.1	25.2	97	75
1976 ASM	(NA)	(NA)	(NA)	8.5	140.0	7.1	15.5	113.4	211.5	61.1	273.3	14.2	20.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	8.9	138.7	7.2	15.8	112.4	219.8	63.6	287.9	12.2	19.4	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	10.0	144.0	8.2	17.6	115.9	247.6	67.0	313.1	6.5	28.6	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	9.2	117.1	7.9	15.1	96.7	185.1	41.4	224.1	5.0	15.0	(NA)	(NA)
1972 Census	1 017	1 021	97	8.5	103.1	7.4	13.9	85.3	161.0	38.8	198.0	5.3	12.9	95	78
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES															
1987 Census	7 207	7 317	1 517	114.4	3 163.6	87.7	185.5	2 251.2	5 293.8	2 227.0	7 550.1	375.3	952.1	94	82
1986 ASM	(NA)	(NA)	(NA)	108.9	3 000.1	85.7	179.4	2 165.1	5 582.2	2 158.1	7 725.1	333.6	913.6	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	110.6	2 904.4	88.6	183.3	2 123.1	5 222.2	2 069.9	7 204.8	401.8	861.5	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	111.2	2 737.8	89.7	188.1	2 021.3	4 681.5	2 010.7	6 614.7	398.8	703.2	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	97.9	2 294.4	78.2	161.1	1 662.5	3 801.7	1 537.1	5 310.6	192.4	590.5	(NA)	(NA)
1982 Census	7 132	7 255	1 322	102.9	2 293.3	81.7	164.9	1 684.9	3 780.5	1 535.4	5 374.9	232.9	621.8	94	79
1981 ASM	(NA)	(NA)	(NA)	124.2	2 632.4	99.6	209.3	1 905.7	4 423.7	1 884.8	6 264.3	275.9	693.1	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	126.3	2 471.0	101.6	214.3	1 798.7	4 121.0	1 734.3	5 823.9	283.5	646.3	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	122.1	2 231.2	98.9	214.5	1 641.7	3 810.6	1 607.5	5 336.2	294.4	574.7	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	112.5	1 946.6	92.7	195.2	1 419.9	3 183.2	1 424.2	4 585.1	228.9	510.2	(NA)	(NA)
1977 Census	7 034	7 153	1 427	105.7	1 708.2	86.4	184.0	1 261.7	2 790.1	1 171.8	3 905.3	177.5	450.3	94	79
1976 ASM	(NA)	(NA)	(NA)	109.9	1 537.0	88.7	179.4	1 163.2	2 502.1	951.0	3 411.6	168.9	370.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	102.9	1 336.6	83.8	168.7	1 005.8	2 141.8	824.7	2 985.6	114.4	315.8	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	117.4	1 486.6	97.2	205.7	1 134.4	2 459.5	928.8	3 367.5	193.1	328.3	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	105.7	1 314.8	87.4	193.6	999.9	2 256.2	782.8	2 930.7	101.7	300.4	(NA)	(NA)
1972 Census	6 513	6 616	1 266	97.8	1 113.8	80.5	173.3	843.6	1 797.4	648.0	2 423.7	97.0	244.1	94	78
INDUSTRY 3545, MACHINE TOOL ACCESSORIES															
1987 Census	91 734	91 879	564	48.4	1 184.4	35.0	71.0	756.8	2 560.8	1 038.1	3 594.8	113.2	812.1	94	93
1986 ASM	(NA)	(NA)	(NA)	47.0	1 113.0	34.0	68.3	720.3	2 423.7	1 002.7	3 452.3	108.5	776.2	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	49.4	1 099.5	36.4	73.2	718.0	2 429.2	1 025.8	3 458.8	167.9	813.6	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	49.5	1 087.9	36.2	727								

Table 1a-1. Historical Statistics for the Industry (1987 Basis): 1987 and Earlier Years—Con.

[Industries with only 1987 data are revised for 1987. Table 1a-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	Companies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expend- itures ⁶ (million dollars)	End-of- year invent- ories ⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Speci- alization ⁷ (per- cent)	Cover- age ⁸ (per- cent)
INDUSTRY 3545, MACHINE TOOL ACCESSORIES—Con.															
1977 Census ---	1 270	1 411	491	54.0	762.0	39.9	80.1	498.0	1 584.8	832.5	2 383.0	77.2	468.3	89	88
1976 ASM -----	(NA)	(NA)	(NA)	51.0	634.4	37.6	73.5	414.4	1 293.4	653.6	1 942.3	51.5	406.0	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	52.4	616.4	38.2	77.1	405.3	1 236.2	599.1	1 847.8	50.3	411.4	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	56.1	625.6	41.7	86.9	422.7	1 322.0	609.8	1 884.1	59.5	425.2	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	52.8	569.3	39.2	81.4	380.6	1 142.6	496.4	1 602.4	36.6	344.4	(NA)	(NA)
1972 Census ---	1 113	1 231	413	46.7	456.6	33.6	67.0	294.5	876.1	378.5	1 243.4	30.2	289.0	86	87
INDUSTRY 3546, POWER-DRIVEN HANDTOOLS															
1987 Census ---	183	199	68	16.8	382.8	11.7	22.3	222.3	1 125.0	1 045.9	2 161.8	46.2	361.2	83	85
1986 ASM -----	(NA)	(NA)	(NA)	17.9	383.8	12.5	24.0	229.3	1 121.5	998.3	2 142.4	72.1	362.1	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	19.2	398.4	13.2	23.9	240.1	1 141.3	996.2	2 155.1	80.3	388.9	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	20.0	392.2	14.2	26.4	245.1	1 088.8	965.9	2 016.3	50.6	423.1	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	19.5	385.1	13.3	24.9	223.2	1 015.9	788.7	1 801.9	45.4	398.8	(NA)	(NA)
1982 Census ---	180	203	74	21.6	393.6	14.5	25.9	228.6	940.3	791.5	1 795.3	68.1	415.0	88	91
1981 ASM -----	(NA)	(NA)	(NA)	26.0	434.2	18.5	35.7	279.4	1 264.1	931.5	2 144.7	79.3	489.7	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	30.5	440.0	22.5	41.5	289.9	1 294.6	1 002.1	2 298.8	82.9	448.0	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	32.3	446.8	24.0	45.9	301.2	1 205.2	1 015.9	2 197.2	85.1	446.1	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	29.8	377.5	21.9	41.8	244.1	1 069.2	870.9	1 929.1	49.9	352.9	(NA)	(NA)
1977 Census ---	99	124	71	27.7	325.7	20.0	38.5	210.4	931.9	703.2	1 623.2	39.0	326.0	91	90
1976 ASM -----	(NA)	(NA)	(NA)	22.0	261.8	15.9	30.4	165.6	702.5	452.7	1 140.7	21.1	262.5	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	21.2	219.9	14.7	27.4	136.8	603.8	418.1	1 059.2	22.3	271.4	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	26.1	252.7	19.3	37.4	167.3	721.6	436.5	1 119.6	35.5	316.5	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	26.5	249.0	18.8	37.3	159.8	562.0	397.1	921.4	25.6	265.1	(NA)	(NA)
1972 Census ---	71	88	65	23.1	202.3	16.9	32.9	124.2	434.5	302.7	730.5	20.3	199.7	82	92
INDUSTRY 3547, ROLLING MILL MACHINERY															
1987 Census ---	83	86	34	3.9	120.7	2.2	4.7	57.4	284.9	249.7	467.8	7.1	170.6	92	94
1986 ASM -----	(NA)	(NA)	(NA)	3.5	101.1	1.9	3.8	46.9	169.6	209.7	380.8	3.6	94.3	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	3.9	106.7	2.2	4.4	53.8	196.7	213.0	453.7	9.2	85.7	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	3.3	89.3	2.0	3.8	45.5	192.8	168.5	323.1	6.0	128.4	(NA)	(NA)
1983 ASM ¹² ----	(NA)	(NA)	(NA)	4.1	94.1	2.5	4.5	51.5	114.2	182.0	373.6	5.3	109.7	(NA)	(NA)
1982 Census ---	58	63	32	5.1	125.1	3.3	6.1	70.8	276.4	246.8	502.9	14.8	168.1	79	79
1981 ASM -----	(NA)	(NA)	(NA)	6.0	135.1	3.9	7.6	81.9	410.4	341.4	736.3	8.3	161.5	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	6.4	139.4	4.5	8.6	87.3	358.1	314.3	687.1	12.8	132.0	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	6.1	119.3	4.2	8.7	76.9	296.1	232.3	481.9	¹⁰ 30.9	154.0	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	7.6	137.6	5.3	9.3	83.6	289.7	189.3	495.2	7.6	118.8	(NA)	(NA)
1977 Census ---	58	63	38	7.9	128.2	5.4	10.4	78.4	286.9	198.3	507.4	9.1	131.8	78	86
1976 ASM -----	(NA)	(NA)	(NA)	10.9	156.2	7.8	14.8	99.3	350.9	247.4	620.8	14.5	168.4	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	10.6	141.1	8.0	15.2	95.3	331.0	259.7	540.5	12.1	181.1	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	10.3	132.9	8.1	16.1	92.6	297.1	202.0	472.2	11.1	136.0	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	9.2	108.1	7.1	14.3	73.1	244.6	152.6	377.2	7.7	106.6	(NA)	(NA)
1972 Census ---	40	47	38	10.4	115.2	7.2	14.2	68.7	206.4	129.0	327.8	6.3	81.0	74	86
INDUSTRY 3548, WELDING APPARATUS ¹³															
1987 Census ---	203	225	130	18.7	541.5	11.5	24.2	292.9	1 084.4	1 062.1	2 104.6	45.4	556.4	90	92
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C. ¹³															
1987 Census ---	293	302	147	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4	265.8	89	88

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the Industry chapter.

²For the Census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during year.

⁴Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture are not comparable to prior-year data.

⁵Detailed data on materials consumed by type are shown in table 7.

⁶Detailed data on new machinery and equipment expenditures are provided in table 3c.

⁷Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in the industry.

⁸Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

⁹For 1987, company and total establishment counts are not directly comparable to prior-years' data. Prior to the 1987 Census of Manufactures, these data included small nonmailed companies (typically with less than 10 employees) classified from administrative records of other Federal agencies and estimated from industry averages. For 1987, these companies were reclassified to SIC industry 3545, Machine Tool Accessories and total 909. In 1982, there were 545, 195, and 524 of these companies classified in SIC industries 3541, 3542, and 3545, respectively, accounting for approximately 3 percent of the value of shipments and value added data.

¹⁰Estimates for new capital expenditures have associated standard errors of 15 percent or more and may be of limited reliability. Estimates for other data items are of acceptable reliability.

¹¹Although there was no change in definition or content, 1972 SIC Industry 3565, Industrial Patterns, was renumbered to 1987 SIC Industry 3543.

¹²Data either have associated standard errors exceeding 15 percent or are not consistent with other census series and related data; thus these estimates may be of limited reliability.

¹³Industry definition is new for 1987 Census of Manufactures. An explanation of the Standard Industrial Classifications revision appears in the Summary of Findings of this report.

Table 1a-2. **Historical Statistics for the Industry (1972 Basis): 1987 and Earlier Years**

[Table 1a-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Companies (no.)	All establishments		All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi- tures (million dollars)	End-of- year inven- tories (million dollars)	Ratios	
		Total (no.)	With 20 employ- ees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Special- ization (per- cent)	Cover- age (per- cent)
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.															
1987 Census ---	394	419	207	18.8	521.2	11.1	22.6	264.2	1 099.9	782.0	1 882.8	45.5	447.3	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	20.0	497.0	12.9	26.5	275.4	938.9	823.2	1 811.8	35.1	409.2	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	20.8	505.1	13.8	27.6	283.1	1 063.1	778.8	1 788.2	48.6	452.4	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	21.5	495.6	14.1	27.9	271.8	1 003.2	765.7	1 727.5	56.2	436.1	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	18.8	409.8	11.9	22.6	215.7	763.9	550.0	1 356.5	31.4	366.6	(NA)	(NA)
1982 Census ---	421	446	197	20.7	431.5	13.0	25.4	233.3	829.9	600.0	1 471.1	52.4	337.6	86	85
1981 ASM -----	(NA)	(NA)	(NA)	25.0	476.4	16.1	33.6	261.0	950.3	724.4	1 655.7	¹⁰ 64.8	412.5	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	24.8	448.5	16.2	33.1	244.5	939.3	665.9	1 550.5	¹⁰ 82.5	386.5	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	24.0	395.0	16.3	32.9	220.5	815.7	572.9	1 340.9	¹⁰ 61.9	331.4	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	20.6	316.2	13.6	26.8	175.5	637.9	471.3	1 106.1	¹⁰ 28.0	247.7	(NA)	(NA)
1977 Census ---	521	534	183	19.4	279.5	12.8	25.2	154.1	562.2	389.1	916.8	30.7	233.8	88	82
1976 ASM -----	(NA)	(NA)	(NA)	14.7	182.1	9.9	19.5	101.4	324.5	275.7	595.9	13.5	151.8	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	14.5	163.8	9.4	18.2	88.5	290.3	261.5	571.5	19.4	149.7	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	15.6	167.2	11.0	21.3	95.9	345.0	264.9	587.0	17.9	178.8	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	15.1	153.3	10.1	20.7	91.9	314.5	203.0	490.2	18.9	133.8	(NA)	(NA)
1972 Census ---	384	393	134	13.6	131.5	9.2	18.3	77.6	267.9	165.4	427.3	12.3	107.6	88	83
INDUSTRY 3623, WELDING APPARATUS, ELECTRIC															
1987 Census ---	150	163	94	14.2	439.3	9.1	19.3	244.8	809.4	882.9	1 654.2	36.6	446.5	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	14.1	398.0	9.0	17.9	212.4	766.7	716.6	1 493.6	23.8	340.8	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	14.9	395.1	9.6	18.6	222.6	817.8	754.0	1 585.7	32.8	372.6	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	14.6	363.4	9.5	18.1	215.4	736.2	730.9	1 459.1	33.1	374.3	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	13.7	300.1	8.2	14.4	162.8	568.6	577.9	1 195.1	26.8	327.9	(NA)	(NA)
1982 Census ---	164	182	108	15.0	340.8	10.0	17.8	204.8	684.2	643.8	1 353.2	44.4	372.7	89	94
1981 ASM -----	(NA)	(NA)	(NA)	17.5	425.5	11.7	24.4	252.4	804.4	966.5	1 753.7	¹⁰ 60.8	352.3	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	17.8	372.4	11.5	23.1	228.5	703.1	809.8	1 511.2	36.6	312.7	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	18.8	364.5	11.9	24.4	213.4	734.9	791.8	1 499.8	31.7	315.0	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	18.7	332.0	12.2	24.6	196.5	655.6	717.4	1 361.3	32.0	279.2	(NA)	(NA)
1977 Census ---	161	176	88	17.5	285.7	11.3	23.0	165.1	582.7	634.2	1 191.2	38.7	258.3	86	94
1976 ASM -----	(NA)	(NA)	(NA)	16.1	236.8	10.6	21.0	138.4	481.9	523.2	1 001.8	19.2	218.9	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	17.0	238.2	11.0	22.3	141.1	511.5	525.4	1 039.6	18.7	221.8	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	18.2	236.9	12.3	25.8	145.2	522.9	523.0	1 008.9	18.2	233.7	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	16.2	192.3	10.8	23.2	120.3	374.0	375.4	748.1	11.5	160.2	(NA)	(NA)
1972 Census ---	154	166	80	15.5	173.9	9.8	20.9	102.5	353.5	314.2	659.6	11.4	149.3	84	92

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1b-1. **Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years**

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES									
1987 Census	29 069	57	1 945	13.16	44	73	52 640	55	47.14
1986 ASM	28 207	57	1 982	12.78	45	77	47 249	60	41.83
1985 ASM	26 345	58	1 916	12.42	44	76	46 729	56	41.93
1984 ASM	24 856	58	1 883	11.65	43	75	42 925	58	39.14
1983 ASM	23 188	57	1 873	11.16	38	73	37 505	62	35.14
1982 Census	22 898	58	1 876	11.15	36	66	43 160	53	39.56
1981 ASM	21 978	64	2 056	9.79	37	65	50 335	44	37.97
1980 ASM	20 659	66	2 067	9.00	39	68	46 005	45	33.90
1979 ASM	18 872	66	2 098	8.21	40	69	41 010	46	29.55
1978 ASM	17 429	66	2 090	7.71	39	70	35 257	49	25.70
1977 Census	15 976	63	2 051	7.09	37	71	31 416	51	24.46
1976 ASM	14 550	65	1 955	6.45	34	68	28 642	51	22.64
1975 ASM	13 539	65	2 002	5.96	39	70	26 119	52	20.08
1974 ASM	13 452	68	2 107	5.51	41	76	24 877	54	17.48
1973 ASM	11 843	66	2 093	5.02	40	78	20 269	58	14.58
1972 Census	10 929	64	2 042	4.78	38	78	17 175	64	13.22

See footnotes at end of table.

Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years
-Con.

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES									
1987 Census.....	30 022	63	2 080	13.08	46	75	53 210	56	40.57
1986 ASM.....	26 536	64	2 000	12.02	47	77	46 127	58	35.78
1985 ASM.....	26 079	65	2 000	11.97	42	75	52 723	49	40.57
1984 ASM.....	25 279	65	1 971	11.72	41	72	48 193	52	37.48
1983 ASM.....	23 333	63	1 854	11.01	40	71	41 150	57	35.37
1982 Census.....	22 466	62	1 917	10.57	40	71	39 887	56	33.53
1981 ASM.....	20 700	67	1 825	9.57	41	72	40 688	51	31.70
1980 ASM.....	19 111	68	1 834	8.90	41	70	38 740	49	29.61
1979 ASM.....	17 985	69	2 005	8.14	41	70	37 185	48	26.77
1978 ASM.....	16 492	67	2 065	7.21	42	73	33 385	49	23.97
1977 Census.....	15 219	68	2 037	6.69	39	71	30 460	50	22.01
1976 ASM.....	14 707	69	2 013	6.69	41	72	27 122	54	19.41
1975 ASM.....	13 196	68	2 023	5.82	44	75	23 781	55	17.27
1974 ASM.....	12 796	70	2 133	5.50	46	80	21 852	59	14.64
1973 ASM.....	11 985	70	2 212	4.91	42	78	20 241	59	13.07
1972 Census.....	11 012	69	2 090	4.72	41	79	17 332	64	12.04
INDUSTRY 3543, INDUSTRIAL PATTERNS									
1987 Census.....	27 616	80	2 000	13.51	23	70	45 267	61	28.21
1986 ASM.....	27 782	84	2 121	12.63	37	69	55 783	50	31.29
1985 ASM.....	26 492	85	2 000	12.72	39	74	49 155	54	29.08
1984 ASM.....	24 814	83	1 914	12.34	40	78	44 600	56	28.13
1983 ASM.....	21 460	81	1 795	11.89	27	79	30 569	70	20.93
1982 Census.....	22 204	83	1 827	11.72	22	70	35 469	63	23.49
1981 ASM.....	23 543	80	1 865	12.32	23	71	37 935	62	25.29
1980 ASM.....	19 072	79	(S)	10.76	27	72	32 365	59	23.01
1979 ASM.....	18 616	86	1 765	9.71	26	72	30 535	61	20.15
1978 ASM.....	17 765	85	1 938	8.39	22	72	28 574	62	17.33
1977 Census.....	16 419	86	1 975	7.73	22	70	27 151	60	15.98
1976 ASM.....	16 470	84	2 183	7.32	22	74	24 882	66	13.65
1975 ASM.....	15 584	81	2 194	7.11	22	70	24 697	63	13.91
1974 ASM.....	14 400	82	2 146	6.59	21	67	24 760	58	14.07
1973 ASM.....	12 728	86	1 911	6.40	18	71	20 120	63	12.26
1972 Census.....	12 129	87	1 878	6.14	20	72	18 941	64	11.58
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES									
1987 Census.....	27 654	77	2 115	12.14	29	71	46 274	60	28.54
1986 ASM.....	27 549	79	2 093	12.07	28	67	51 260	54	31.12
1985 ASM.....	26 260	80	2 069	11.58	29	69	47 217	56	28.49
1984 ASM.....	24 620	81	2 097	10.75	30	72	42 100	58	24.89
1983 ASM.....	23 436	80	2 060	10.32	29	72	38 832	60	23.60
1982 Census.....	22 286	79	2 018	10.22	29	71	36 740	61	22.93
1981 ASM.....	21 194	80	2 101	9.11	30	72	35 618	60	21.14
1980 ASM.....	19 564	80	2 109	8.39	30	72	32 629	60	19.23
1979 ASM.....	18 273	81	2 169	7.65	30	72	31 209	59	17.77
1978 ASM.....	17 303	82	2 106	7.27	31	74	28 295	61	16.31
1977 Census.....	16 160	82	2 130	6.86	30	74	26 396	61	15.16
1976 ASM.....	13 985	81	2 023	6.48	28	73	22 767	61	13.95
1975 ASM.....	12 989	81	2 013	5.96	28	72	20 814	62	12.70
1974 ASM.....	12 662	83	2 116	5.51	28	72	20 950	60	11.96
1973 ASM.....	12 438	83	2 215	5.16	27	72	21 345	58	11.65
1972 Census.....	11 388	82	2 153	4.87	27	73	18 378	62	10.37
INDUSTRY 3545, MACHINE TOOL ACCESSORIES									
1987 Census.....	24 471	72	2 029	10.66	29	62	52 909	46	36.07
1986 ASM.....	23 680	72	2 009	10.55	29	61	51 568	46	35.49
1985 ASM.....	22 257	74	2 011	9.81	30	61	49 174	45	33.19
1984 ASM.....	21 977	73	2 011	9.77	29	61	49 145	45	33.42
1983 ASM.....	20 266	69	1 917	9.68	30	66	38 518	53	29.06
1982 Census.....	19 413	70	1 894	9.39	31	65	39 279	49	29.45
1981 ASM.....	19 268	74	1 989	8.58	35	64	43 432	44	29.65
1980 ASM.....	17 738	74	1 993	7.91	35	64	41 124	43	27.88
1979 ASM.....	16 327	76	2 044	7.09	35	65	37 544	43	24.30
1978 ASM.....	15 331	75	2 025	6.81	34	65	33 845	45	22.26
1977 Census.....	14 111	74	2 008	6.22	35	67	29 348	48	19.79
1976 ASM.....	12 439	74	1 955	5.64	34	66	25 361	49	17.60
1975 ASM.....	11 763	73	2 018	5.26	32	66	23 592	50	16.03
1974 ASM.....	11 151	74	2 084	4.86	32	66	23 565	47	15.21
1973 ASM.....	10 782	74	2 077	4.68	31	67	21 640	50	14.04
1972 Census.....	9 777	72	1 994	4.40	30	67	18 760	52	13.08
INDUSTRY 3546, POWER-DRIVEN HANDTOOLS									
1987 Census.....	22 786	70	1 906	9.97	48	66	66 964	34	50.45
1986 ASM.....	21 441	70	1 920	9.55	47	65	62 654	34	46.73
1985 ASM.....	20 750	69	1 811	10.05	46	65	59 443	35	47.75
1984 ASM.....	19 610	71	1 859	9.28	48	67	54 440	36	41.24
1983 ASM.....	19 748	68	1 872	8.96	44	65	52 097	38	40.80
1982 Census.....	18 222	67	1 786	8.83	44	66	43 532	42	36.31
1981 ASM.....	16 700	71	1 930	7.83	43	64	48 619	34	35.41
1980 ASM.....	14 426	74	1 844	6.99	44	63	42 446	34	31.20
1979 ASM.....	13 832	74	1 913	6.56	46	67	37 313	37	26.26
1978 ASM.....	12 667	73	1 909	5.84	45	65	35 879	35	25.58

See footnotes at end of table.

Table 1b-1. Selected Operating Ratios for the Industry (1987 Basis): 1987 and Earlier Years

—Con.

[Industries with only 1987 data are revised for 1987. Table 1b-2 contains historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3546, POWER-DRIVEN HANDTOOLS—Con.									
1977 Census.....	11 758	72	1 925	5.46	43	63	33 643	35	24.21
1976 ASM.....	11 900	72	1 912	5.45	40	63	31 932	37	23.11
1975 ASM.....	10 372	69	1 864	4.99	39	60	28 481	36	22.04
1974 ASM.....	9 681	74	1 938	4.47	39	62	27 648	35	19.29
1973 ASM.....	9 396	71	1 984	4.28	43	70	21 208	44	15.07
1972 Census.....	8 757	73	1 947	3.78	41	69	18 810	47	13.21
INDUSTRY 3547, ROLLING MILL MACHINERY									
1987 Census.....	30 949	56	2 136	12.21	53	79	73 051	42	60.62
1986 ASM.....	28 885	54	2 000	12.34	55	82	48 457	60	44.63
1985 ASM.....	27 358	56	2 000	12.23	47	70	50 436	54	44.70
1984 ASM.....	27 060	61	1 900	11.97	52	80	58 424	46	50.74
1983 ASM.....	22 951	61	1 800	11.44	49	74	27 854	82	25.38
1982 Census.....	24 529	65	1 848	11.61	49	74	54 196	45	45.31
1981 ASM.....	22 516	65	1 949	10.78	46	65	68 400	33	54.00
1980 ASM.....	21 781	70	1 911	10.15	46	66	55 953	39	41.64
1979 ASM.....	19 557	69	2 071	8.84	48	73	48 541	40	34.03
1978 ASM.....	18 105	70	1 755	8.99	38	66	38 118	47	31.15
1977 Census.....	16 227	68	1 926	7.54	39	64	36 316	45	27.59
1976 ASM.....	14 330	72	1 897	6.71	40	65	32 193	45	23.71
1975 ASM.....	13 311	75	1 900	6.27	48	74	31 226	43	21.78
1974 ASM.....	12 902	79	1 988	5.75	43	71	28 845	45	18.45
1973 ASM.....	11 750	77	2 014	5.11	40	69	26 587	44	17.10
1972 Census.....	11 076	69	1 972	4.84	39	74	19 846	56	14.54
INDUSTRY 3548, WELDING APPARATUS									
1987 Census.....	28 957	61	2 104	12.10	50	76	57 989	50	44.81
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.									
1987 Census.....	29 461	61	2 100	12.37	43	75	51 591	57	40.36

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1b-2. Selected Operating Ratios for the Industry (1972 Basis): 1987 and Earlier Years

[Table 1b-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.									
1987 Census.....	27 723	59	2 036	11.69	42	69	58 505	47	48.67
1986 ASM.....	24 850	65	2 054	10.39	45	73	46 945	53	35.43
1985 ASM.....	24 283	66	2 000	10.26	44	72	51 111	48	38.52
1984 ASM.....	23 051	66	1 979	9.74	44	73	46 660	49	35.96
1983 ASM.....	21 797	63	1 899	9.54	41	71	40 633	54	33.80
1982 Census.....	20 845	63	1 954	9.19	41	70	40 092	52	32.67
1981 ASM.....	19 056	64	2 087	7.77	44	73	38 012	50	28.28
1980 ASM.....	18 084	65	2 043	7.39	43	72	37 875	48	28.38
1979 ASM.....	16 458	68	2 018	6.70	43	72	33 988	48	24.79
1978 ASM.....	15 349	66	1 971	6.55	43	71	30 966	50	23.80
1977 Census.....	14 407	66	1 969	6.12	42	73	28 979	50	22.31
1976 ASM.....	12 387	67	1 970	5.20	46	77	22 075	56	16.64
1975 ASM.....	11 296	65	1 936	4.86	46	74	20 021	56	15.95
1974 ASM.....	10 717	71	1 936	4.50	45	74	22 115	48	16.20
1973 ASM.....	10 152	67	2 050	4.44	41	73	20 828	49	15.19
1972 Census.....	9 669	68	1 989	4.24	39	69	19 699	49	14.64
INDUSTRY 3623, WELDING APPARATUS, ELECTRIC									
1987 Census.....	30 937	64	2 121	12.68	53	80	57 000	54	41.94
1986 ASM.....	28 226	64	1 989	11.87	48	75	54 376	52	42.83
1985 ASM.....	26 516	64	1 938	11.97	48	72	54 886	48	43.97
1984 ASM.....	24 890	65	1 905	11.90	50	75	50 425	49	40.67
1983 ASM.....	21 905	60	1 756	11.31	48	73	41 504	53	39.49
1982 Census.....	22 720	67	1 780	11.51	48	73	45 613	50	38.44
1981 ASM.....	24 314	67	2 085	10.34	55	79	45 966	53	32.97
1980 ASM.....	20 921	65	2 009	9.89	54	78	39 500	53	30.44
1979 ASM.....	19 388	63	2 050	8.75	53	77	39 090	50	30.12
1978 ASM.....	17 754	65	2 016	7.99	53	77	35 059	51	26.65

See footnotes at end of table.

Table 1b-2. Selected Operating Ratios for the Industry (1972 Basis): 1987 and Earlier Years
—Con.

[Table 1b-2 contains the historical data on the old SIC basis. See table 1c-1 for composition of the new industry on the old SIC basis. Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3623, WELDING APPARATUS, ELECTRIC—Con.									
1977 Census.....	16 325	65	2 035	7.18	53	77	33 297	49	25.33
1976 ASM.....	14 708	66	1 981	6.59	52	76	29 932	49	22.95
1975 ASM.....	14 011	65	2 027	6.33	51	73	30 088	47	22.94
1974 ASM.....	13 016	68	2 098	5.63	52	75	28 731	45	20.27
1973 ASM.....	11 870	67	2 148	5.19	50	76	23 086	51	16.12
1972 Census.....	11 219	63	2 133	4.90	48	74	22 806	49	16.91

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1c-1. 1987 Statistics for the Industry Showing the Distribution of 1987 SIC-Based Industries Among 1972 SIC-Based Industries

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
New Industry 3548, Welding Apparatus.....	225	18.7	541.5	11.5	24.2	292.9	1 084.4	1 062.1	2 104.6	45.4	556.4
Old Industry 3549, Metalworking Machinery, N.E.C. -	62	4.4	102.1	2.5	4.9	48.1	275.1	179.2	450.5	8.8	109.8
Old Industry 3623, Welding Apparatus, Electric.....	163	14.2	439.3	9.1	19.3	244.8	809.4	882.9	1 654.2	36.6	446.5
New Industry 3549, Metalworking Machinery, N.E.C. -	302	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4	265.8
Old Industry 3549, Metalworking Machinery, N.E.C. -	302	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4	265.8

Note: For qualifications of data, see footnotes on table 1a-1.

Table 1c-2. 1987 Statistics for the Industry Showing the Distribution of 1972 SIC-Based Industries Among 1987 SIC-Based Industries

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
		Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
Old Industry 3549, Metalworking Machinery, N.E.C.	419	18.8	521.2	11.1	22.6	264.2	1 099.9	782.0	1 882.8	45.5	447.3
New Industry 3548, Welding Apparatus.....	62	4.4	102.1	2.5	4.9	48.1	275.1	179.2	450.5	8.8	109.8
New Industry 3549, Metalworking Machinery, N.E.C.	302	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4	265.8
New Industry 3559, Special Industry Machinery, N.E.C.	54	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
New Industry 3699, Electrical Equipment and Supplies, N.E.C.....	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Old Industry 3623, Welding Apparatus, Electric.....	163	14.2	439.3	9.1	19.3	244.8	809.4	882.9	1 654.2	36.6	446.5
New Industry 3548, Welding Apparatus.....	163	14.2	439.3	9.1	19.3	244.8	809.4	882.9	1 654.2	36.6	446.5

Note: For qualifications of data, see footnotes on table 1a-1.

Table 2. Industry Statistics for Selected States: 1987 and 1982

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	E1	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES														
United States	-	417	232	31.7	921.5	18.2	35.4	465.7	1 668.7	1 399.5	3 189.5	61.1	58.3	2 516.2
California	E1	33	8	.7	19.9	.5	1.0	11.2	38.7	36.6	73.7	1.6	1.4	50.4
Connecticut	-	24	12	2.2	63.4	1.3	2.7	34.3	96.3	99.3	212.8	2.7	5.1	180.4
Florida	-	5	2	.2	3.9	.1	.2	2.3	5.6	2.9	8.3	(Z)	.2	5.3
Illinois	-	41	22	3.4	102.7	1.8	3.0	44.1	202.2	140.8	332.1	(D)	5.4	207.9
Indiana	-	10	7	.7	19.8	.4	.9	9.1	25.3	34.7	64.4	.9	1.3	35.7
Iowa	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Kansas	E2	3	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Kentucky	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Massachusetts	-	17	8	1.2	36.3	.7	1.4	17.5	61.4	39.8	104.4	1.6	2.6	114.4
Michigan	-	104	56	4.5	153.9	2.8	5.9	79.0	299.8	310.3	670.6	9.9	8.9	491.1
Minnesota	-	13	8	.9	23.5	.5	1.0	11.4	46.3	38.1	83.7	2.6	1.2	49.0
New Hampshire	-	2	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
New Jersey	E1	12	6	.4	11.4	.3	.6	7.0	20.7	11.5	31.3	.1	.4	17.1
New York	-	16	12	3.2	88.5	2.0	3.6	49.4	162.6	75.9	249.4	12.6	4.9	176.2
North Carolina	-	4	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	8.2
Ohio	-	43	25	5.9	176.0	3.1	5.9	86.6	298.4	276.5	598.4	(D)	12.3	547.2
Oregon	-	5	3	.2	4.4	.1	.2	2.0	9.1	4.5	13.4	(D)	(NA)	(NA)
Pennsylvania	-	17	13	1.1	28.9	.6	1.3	14.4	52.7	34.6	85.3	2.3	2.1	86.2
Rhode Island	-	6	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)
South Carolina	-	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Vermont	-	3	3	.9	22.1	.5	1.1	11.5	35.4	20.0	63.6	(D)	2.6	90.7
Virginia	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Wisconsin	E1	21	13	2.2	63.6	1.1	2.2	28.8	143.5	68.2	221.1	6.1	3.4	254.6
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES														
United States	E1	207	120	13.8	414.3	8.7	18.1	236.7	734.3	637.8	1 396.3	31.2	19.5	777.8
California	E1	19	9	.8	23.9	.4	.9	11.7	43.6	50.2	97.5	(D)	1.0	38.0
Colorado	-	2	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Connecticut	E1	9	3	.3	10.8	.2	.4	5.8	16.9	7.5	25.1	(D)	.8	27.7
Illinois	-	27	20	3.6	107.4	2.2	4.6	63.1	137.7	145.4	322.5	7.1	4.4	231.6
Indiana	E3	9	6	.3	9.4	.2	.4	5.2	16.7	11.0	26.9	.6	BB	(D)
Kansas	-	4	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	10.2
Massachusetts	E1	3	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Michigan	E1	37	19	1.8	54.3	1.2	2.8	35.7	108.4	80.7	190.8	3.9	1.6	67.4
Missouri	-	5	3	.2	4.0	.1	.3	3.4	6.3	5.1	11.7	(D)	.3	9.4
New Jersey	E7	9	4	.3	9.5	.2	.4	5.7	15.0	13.8	28.6	.3	BB	(D)
New York	E1	8	5	1.1	36.8	.6	1.4	17.3	70.6	46.3	118.8	1.0	1.7	49.3
North Carolina	E3	4	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
Ohio	-	27	16	2.9	91.6	1.8	3.5	49.7	193.3	126.3	303.3	7.7	4.4	173.0
Pennsylvania	-	7	6	.5	14.9	.3	.6	6.7	13.7	49.6	69.9	1.1	EE	(D)
Virginia	-	3	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	AA	(D)
INDUSTRY 3543, INDUSTRIAL PATTERNS														
United States	E1	813	85	8.6	237.5	6.9	13.8	186.4	389.3	112.5	499.4	18.5	9.8	347.6
Alabama	-	13	3	.2	5.5	.2	.3	4.4	10.4	3.6	15.6	(D)	BB	(D)
California	E4	76	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	23.0
Illinois	E2	64	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.8	27.6
Indiana	E2	29	9	.4	10.4	.3	.6	8.5	17.6	4.5	21.8	1.1	.5	17.1
Michigan	-	111	24	1.9	72.1	1.5	3.2	55.2	109.6	26.2	134.3	4.7	1.9	81.0
Minnesota	E1	18	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	8.5
Missouri	E5	15	2	.2	4.5	.1	.3	3.4	7.4	2.7	10.2	.6	AA	(D)
New York	E5	38	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	15.8
Ohio	E1	104	9	1.2	32.3	1.0	2.1	26.0	56.9	12.4	69.3	2.5	EE	(D)
Oregon	E2	16	3	.2	4.2	.2	.3	3.3	7.0	1.5	8.4	(D)	.2	6.6
Pennsylvania	E2	49	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)
Tennessee	-	6	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas	E4	30	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
Wisconsin	E1	64	11	.9	27.4	.7	1.5	21.6	45.8	10.1	53.6	3.3	CC	(D)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1987											1982		
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)	
	E ¹	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)							Wages (million dollars)
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES														
United States -----	E1	7 317	1 517	114.4	3 163.6	87.7	185.5	2 251.2	5 293.8	2 227.0	7 550.1	375.3	102.9	3 780.5
Alabama -----	E1	47	15	1.0	21.2	.8	1.7	15.3	34.1	17.7	51.7	(D)	CC	(D)
Arizona -----	E2	63	14	.8	17.5	.6	1.3	13.4	29.1	9.7	38.7	(D)	.5	16.5
Arkansas -----	E2	58	5	.5	9.5	.3	.7	7.0	18.3	6.5	24.7	1.2	.3	8.0
California -----	E2	639	91	7.5	199.8	5.7	11.9	139.2	353.2	150.5	502.1	18.6	6.8	266.0
Colorado -----	E1	46	5	.5	12.9	.4	.7	9.2	18.8	9.6	27.8	.6	.3	14.1
Connecticut -----	E2	264	36	3.0	80.1	2.2	4.6	55.1	134.8	47.7	182.6	7.3	2.9	97.7
Florida -----	E3	163	15	1.5	34.8	1.1	2.4	25.4	61.5	22.6	83.8	2.9	1.5	44.1
Georgia -----	-	63	10	1.0	21.5	.8	1.7	15.2	34.4	25.6	60.3	1.8	.6	17.6
Illinois -----	E2	734	147	10.5	307.4	8.2	17.4	223.1	505.2	215.0	715.8	30.0	9.1	354.8
Indiana -----	E1	384	101	6.7	178.8	5.2	11.1	130.1	300.3	103.9	398.6	18.4	5.8	186.2
Iowa -----	E1	41	15	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	16.8
Kansas -----	E1	33	7	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	10.2
Kentucky -----	E2	66	13	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.8	20.3
Maine -----	-	10	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	10.9
Maryland -----	E3	23	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	7.1
Massachusetts -----	E2	244	45	2.9	75.3	2.2	4.7	55.0	119.6	45.4	163.6	7.8	3.6	111.7
Michigan -----	-	1 237	355	27.6	889.3	20.6	44.9	605.9	1 480.9	665.7	2 162.9	128.7	23.8	1 059.5
Minnesota -----	E1	145	25	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.8	62.4
Mississippi -----	E3	27	6	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	8.8
Missouri -----	E1	142	29	2.2	56.5	1.6	3.2	39.3	92.9	46.6	137.9	5.9	1.8	63.8
New Hampshire -----	E2	37	4	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	8.7
New Jersey -----	E2	292	51	4.0	103.8	3.1	6.4	76.3	178.5	64.8	244.5	10.2	3.9	135.8
New York -----	E2	405	67	4.8	111.8	3.7	7.5	80.9	147.5	75.2	260.3	14.4	5.0	148.6
North Carolina -----	E1	85	12	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	20.1
Ohio -----	E1	773	198	14.7	391.5	11.5	24.6	288.4	692.4	280.4	966.0	45.2	13.7	488.2
Oklahoma -----	E3	24	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	6.9
Oregon -----	E3	44	2	.3	7.8	.2	.5	5.6	11.6	4.8	16.3	.5	.3	10.5
Pennsylvania -----	-	413	103	8.5	226.3	6.6	13.6	164.1	383.4	162.3	545.3	30.4	8.2	300.5
Rhode Island -----	E3	51	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	12.6
South Carolina -----	E2	52	10	.6	12.5	.5	.9	8.5	22.9	12.0	35.1	1.3	.4	12.7
Tennessee -----	E1	122	23	1.5	36.4	1.1	2.2	24.3	55.3	25.3	80.4	(D)	1.2	36.4
Texas -----	E3	142	22	1.5	33.1	1.2	2.7	25.2	57.3	23.5	80.9	2.8	1.4	49.6
Virginia -----	E2	25	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	5.4
Washington -----	E1	47	5	.3	8.8	.3	.5	6.5	14.6	5.8	20.1	1.3	.2	5.1
Wisconsin -----	E1	302	61	4.8	141.0	3.7	7.8	103.4	226.7	84.1	310.2	16.2	3.9	127.2
INDUSTRY 3545, MACHINE TOOL ACCESSORIES														
United States -----	E1	1 879	564	48.4	1 184.4	35.0	71.0	756.8	2 560.8	1 038.1	3 594.8	113.2	55.1	2 164.3
Alabama -----	E2	12	4	.4	7.0	.3	.6	4.8	24.3	7.4	31.4	(D)	CC	(D)
Arizona -----	E2	16	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arkansas -----	E2	14	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.9	29.1
California -----	E3	215	34	2.5	56.4	1.9	3.6	36.9	112.1	47.2	159.3	3.6	2.4	86.7
Connecticut -----	E1	98	27	1.9	47.7	1.3	2.8	28.2	88.4	37.1	123.6	(D)	2.5	83.7
Florida -----	E3	35	10	.6	12.9	.5	.9	8.2	24.7	10.1	35.0	1.6	.8	24.0
Georgia -----	E1	16	4	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.8	25.9
Illinois -----	E1	125	40	3.8	91.0	2.8	5.7	59.9	181.6	76.9	261.5	7.1	4.9	173.7
Indiana -----	E2	58	16	1.2	26.0	.9	2.0	18.4	54.2	17.8	72.1	1.9	1.0	36.1
Iowa -----	-	16	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	9.3
Kentucky -----	E2	11	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts -----	E1	77	33	3.7	88.8	2.6	5.3	56.5	165.1	64.3	231.8	7.2	5.4	186.2
Michigan -----	E1	424	152	9.3	256.0	6.5	13.6	163.4	530.8	220.6	747.8	21.0	11.6	503.4
Minnesota -----	E2	29	8	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	19.1
Missouri -----	-	17	2	.5	11.3	.3	.5	6.7	23.3	8.9	31.8	.2	EE	(D)
New Hampshire -----	E9	16	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)
New Jersey -----	E1	62	15	1.2	28.1	.9	1.8	18.1	68.4	45.5	112.8	1.7	1.2	55.4
New York -----	E1	107	29	2.2	53.5	1.5	3.0	28.4	104.0	56.3	161.2	8.9	2.4	85.4
North Carolina -----	E1	28	9	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.8	34.1
Ohio -----	E1	172	62	6.7	171.1	4.6	9.1	101.2	399.6	134.2	538.0	18.2	7.7	352.4
Pennsylvania -----	E1	79	25	2.8	69.9	2.0	4.1	45.7	135.0	45.3	180.0	(D)	2.1	77.0
Rhode Island -----	-	23	8	1.2	32.6	.9	1.8	20.9	63.3	21.9	82.3	5.0	1.3	43.9
South Carolina -----	-	22	18	1.5	31.5	1.2	2.6	23.2	101.5	48.4	148.1	2.7	1.4	57.3
Tennessee -----	-	20	8	.9	21.5	.7	1.4	15.7	69.5	19.9	84.0	(D)	.8	46.6
Texas -----	E1	42	10	.6	13.8	.5	.9	9.8	33.1	14.2	48.6	(D)	.8	36.9
Utah -----	-	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Vermont -----	-	13	5	.7	15.4	.6	1.2	11.9	33.8	9.9	44.1	1.5	.8	25.9
Virginia -----	-	9	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.4	20.3
Wisconsin -----	E1	43	14	1.5	36.1	1.1	2.3	23.4	81.0	43.0	125.3	4.6	1.4	51.0

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

[Excludes data for auxiliaries. States with 150 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area		1987										1982			
		All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)	
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)							
E ¹															
INDUSTRY 3546, POWER-DRIVEN HANDTOOLS															
United States	-	199	68	16.8	382.8	11.7	22.3	222.3	1 125.0	1 045.9	2 161.8	46.2	21.6	940.3	
Arizona	-	4	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)	
Arkansas	-	4	3	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)	
California	E5	25	5	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	14.2	
Illinois	E1	14	2	.3	5.4	.2	.3	2.8	8.4	10.8	21.1	.7	1.1	41.3	
Indiana	-	7	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Iowa	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)	
Maryland	-	2	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)	
Massachusetts	E1	6	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)	
Mississippi	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)	
New York	-	11	4	1.0	26.6	.7	1.4	17.5	70.4	61.1	119.2	2.6	EE	(D)	
North Carolina	-	11	7	FF	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	3.4	155.3	
Ohio	E1	19	10	1.6	45.0	.9	1.9	23.6	92.4	50.8	143.6	3.2	2.0	64.3	
Oregon	-	4	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Pennsylvania	-	8	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)	
South Carolina	-	4	4	2.1	47.3	1.5	2.8	25.6	107.2	113.9	225.9	5.9	EE	(D)	
Tennessee	-	3	2	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)	
Texas	E1	9	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	28.1	
Virginia	-	1	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	BB	(D)	
Wisconsin	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	EE	(D)	
INDUSTRY 3547, ROLLING MILL MACHINERY															
United States	-	86	34	3.9	120.7	2.2	4.7	57.4	284.9	249.7	467.8	7.1	5.1	276.4	
Illinois	-	7	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Indiana	-	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Massachusetts	-	5	1	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	CC	(D)	
Ohio	-	15	9	1.2	38.3	.7	1.4	18.8	72.9	66.3	138.2	1.4	1.4	76.5	
Pennsylvania	-	8	6	.8	27.0	.4	.8	9.5	109.6	84.3	131.7	2.1	1.9	118.8	
INDUSTRY 3548, WELDING APPARATUS															
United States	-	225	130	18.7	541.5	11.5	24.2	292.9	1 084.4	1 062.1	2 104.6	45.4	(NA)	(NA)	
California	E1	24	12	1.0	26.8	.6	1.2	13.8	64.6	48.4	110.7	1.7	(NA)	(NA)	
Colorado	-	2	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Florida	E9	6	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Georgia	E1	4	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Illinois	-	11	10	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Indiana	-	6	3	.2	6.8	.1	.2	1.8	.6	15.9	23.3	.5	(NA)	(NA)	
Kansas	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Massachusetts	E3	3	2	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Michigan	E1	48	34	2.8	96.5	2.0	4.6	58.8	129.9	227.7	344.9	5.2	(NA)	(NA)	
Minnesota	-	4	1	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Missouri	E4	9	6	.7	12.8	.5	.9	8.2	28.2	26.8	55.5	.9	(NA)	(NA)	
New Hampshire	-	3	3	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
New Jersey	E1	6	5	.2	5.3	.1	.2	2.6	10.5	9.2	19.8	.2	(NA)	(NA)	
New York	-	10	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
North Carolina	-	4	3	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Ohio	-	21	13	4.6	161.0	3.1	6.6	97.1	283.6	332.7	593.7	14.0	(NA)	(NA)	
Pennsylvania	-	15	8	1.1	29.1	.7	1.3	15.8	90.4	52.5	141.6	3.3	(NA)	(NA)	
South Carolina	-	3	2	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
South Dakota	-	1	1	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Texas	-	8	3	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Wisconsin	-	9	4	EE	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.															
United States	E1	302	147	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4	(NA)	(NA)	
California	E5	25	9	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Connecticut	E1	14	6	.5	15.4	.3	.8	9.2	31.0	14.8	45.3	(D)	(NA)	(NA)	
Illinois	-	32	15	1.6	43.8	1.0	1.9	22.5	79.7	52.9	136.4	5.3	(NA)	(NA)	
Indiana	E3	12	8	.4	13.3	.3	.6	7.3	19.6	17.6	35.5	1.0	(NA)	(NA)	
Massachusetts	-	12	5	.4	8.1	.2	.6	4.5	15.8	11.1	27.1	(D)	(NA)	(NA)	
Michigan	E1	51	29	2.4	82.2	1.5	3.3	43.7	128.1	140.1	266.0	(D)	(NA)	(NA)	
Minnesota	-	6	4	AA	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
New Jersey	E3	15	9	.4	11.9	.2	.5	6.1	20.8	14.3	34.4	.3	(NA)	(NA)	
New York	E2	15	12	CC	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Ohio	E1	28	14	.9	25.6	.6	1.2	14.2	48.1	36.5	82.3	(D)	(NA)	(NA)	
Oklahoma	-	3	2	BB	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)	
Pennsylvania	E2	21	10	.8	21.2	.5	.9	11.1	39.1	32.0	70.8	(D)	(NA)	(NA)	
Texas	-	7	4	.4	9.2	.2	.5	5.4	8.0	16.7	35.7	.6	(NA)	(NA)	
Wisconsin	-	16	8	1.2	37.3	.8	1.4	20.8	67.1	27.9	99.6	1.5	(NA)	(NA)	

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1987 and 1982—Con.

Note: For qualifications of data, see footnotes on table 1a-1.

¹Payroll and sales data for some small single-unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 150 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: AA—150 to 249 employees; BB—250 to 499 employees; CC—500 to 999 employees; EE—1,000 to 2,499 employees; FF—2,500 employees or more.

Table 3a. Summary Statistics for the Industry: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendices]

Item	Machine tools, metal cutting types (SIC 3541)	Machine tools, metal forming types (SIC 3542)	Industrial patterns (SIC 3543)	Special dies, tools, jigs, and fixtures (SIC 3544)	Machine tool accessories (SIC 3545)	Power-driven handtools (SIC 3546)	Rolling mill machinery (SIC 3547)	Welding apparatus (SIC 3548)	Metalworking machinery, n.e.c. (SIC 3549)
Companies number..	381	196	812	7 207	1 734	183	83	203	293
All establishments do..	417	207	813	7 317	1 879	199	86	225	302
With 1 to 19 employees do..	185	87	728	5 800	1 315	131	52	95	155
With 20 to 99 employees do..	169	87	77	1 397	468	34	25	84	124
With 100 employees or more do..	63	33	8	120	96	34	9	46	23
Employment and labor costs:									
Employees 1,000..	31.7	13.8	8.6	114.4	48.4	16.8	3.9	18.7	11.5
Compensation, total mil dol..	1 142.1	513.9	284.8	3 831.2	1 460.3	481.2	148.2	648.2	409.6
Annual payroll do..	921.5	414.3	237.5	3 163.6	1 184.4	382.8	120.7	541.5	338.8
Fringe benefits do..	220.6	99.6	47.3	667.6	275.9	98.3	27.4	106.7	70.7
Social Security and other legally required payments do..	88.7	38.7	15.2	293.5	113.8	37.0	12.2	48.4	30.3
Employer payments and other programs do..	131.9	60.9	32.1	374.1	162.0	61.3	15.2	58.4	40.4
Production workers:									
Average for year 1,000..	18.2	8.7	6.9	87.7	35.0	11.7	2.2	11.5	7.0
March do..	18.5	8.7	6.7	87.5	34.6	11.3	2.2	11.2	7.0
May do..	18.3	8.6	6.8	87.3	34.8	11.5	2.3	11.4	6.9
August do..	18.0	8.6	6.9	87.2	35.0	11.8	2.3	11.7	7.0
November do..	17.7	8.7	7.1	87.4	34.9	11.9	2.2	11.7	7.0
Hours millions..	35.4	18.1	13.8	185.5	71.0	22.3	4.7	24.2	14.7
January to March do..	9.1	4.5	3.3	46.5	17.5	5.4	1.1	5.9	3.7
April to June do..	8.9	4.5	3.4	46.1	17.9	5.7	1.2	6.0	3.6
July to September do..	8.7	4.4	3.5	46.1	17.6	5.4	1.2	6.1	3.7
October to December do..	8.7	4.7	3.6	46.8	18.0	5.7	1.2	6.2	3.7
Wages mil dol..	465.7	236.7	186.4	2 251.2	756.8	222.3	57.4	292.9	181.9
Value added by manufacture do..	1 668.7	734.3	389.3	5 293.8	2 560.8	1 125.0	284.9	1 084.4	593.3
Cost of materials ¹ do..	1 399.5	637.8	112.5	2 227.0	1 038.1	1 045.9	249.7	1 062.1	451.6
Materials, parts, containers, etc., consumed ² do..	1 151.4	542.9	91.4	1 638.1	800.6	846.6	192.8	899.8	394.7
Resales do..	150.0	52.5	1.8	71.4	99.6	166.2	20.8	77.1	8.2
Fuels do..	9.6	4.3	2.7	29.2	10.5	3.2	2.5	7.9	3.0
Purchased electricity do..	34.5	12.4	5.4	84.6	56.3	18.6	5.4	20.7	8.7
Contract work do..	54.1	25.7	11.2	403.8	71.1	11.3	28.1	56.6	37.0
Quantity of electric energy used for heat and power:									
Purchased mil kWh..	565.2	234.5	104.2	1 397.7	979.1	328.1	89.5	348.4	147.2
Generated less sold do..	(S)	-	-	1.3	(D)	-	-	-	-
Total value of shipments mil dol..	3 189.5	1 396.3	499.4	7 550.1	3 594.8	2 161.8	467.8	2 104.6	1 055.0
Primary products do..	2 394.1	1 186.1	445.0	6 678.0	3 162.9	1 609.5	378.0	1 772.3	898.8
Secondary products do..	484.8	116.7	36.5	418.8	211.2	335.6	32.3	200.1	112.7
Miscellaneous receipts, total do..	310.6	93.5	17.9	453.2	220.8	216.6	57.5	132.2	43.6
Value of resales do..	206.7	70.3	2.2	115.6	144.0	211.4	26.3	110.7	11.8
Contract receipts do..	37.2	8.4	11.6	237.2	51.9	3.3	22.5	5.7	16.2
Sales of scrap and refuse do..	.2	.4	(X)	4.9	1.0	(D)	(D)	(X)	(D)
Receipts for installation or construction of products of the establishment do..	(D)	1.2	(X)	(X)	(X)	(X)	-	(X)	.3
Receipts for research and development work do..	4.0	(D)	(X)	5.8	.9	(X)	-	-	(D)
Receipts for repair work do..	40.9	3.8	(X)	35.1	17.3	(D)	(D)	5.6	6.4
Other miscellaneous receipts do..	(D)	(D)	(X)	28.5	4.5	(D)	4.7	9.3	8.0
Miscellaneous receipts, n.s.k. do..	.7	2.4	4.1	26.1	1.2	.1	(Z)	.9	.3
Inventories by stage of fabrication:									
Beginning of 1987 mil dol..	1 180.0	564.1	39.9	1 001.8	803.1	346.6	103.9	507.8	280.5
Finished goods do..	268.5	130.5	7.5	130.9	339.1	154.4	14.2	142.6	54.4
Work in process do..	681.6	343.1	25.2	656.5	289.8	112.1	74.3	210.0	158.7
Materials and supplies do..	229.9	90.5	7.1	214.4	174.3	80.1	15.4	155.3	67.4
End of 1987 do..	1 056.8	529.3	43.0	952.1	812.1	361.2	170.6	556.4	265.8
Finished goods do..	235.5	128.6	5.9	126.8	342.1	175.9	13.7	165.6	53.6
Work in process do..	593.3	320.8	29.3	631.3	290.8	99.8	141.5	228.8	149.4
Materials and supplies do..	227.9	80.0	7.9	194.0	179.2	85.5	15.4	161.9	62.8
Primary product specialization ratio percent..	83	91	92	94	94	83	92	90	89
Coverage ratio do..	93	87	80	82	93	85	94	92	88

Note: For qualifications of data, see footnotes on table 1a-1.

¹Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.²Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1987

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tools, metal cutting types (SIC 3541)	Machine tools, metal forming types (SIC 3542)	Industrial patterns (SIC 3543)	Special dies, tools, jigs, and fixtures (SIC 3544)	Machine tool accessories (SIC 3545)	Power-driven handtools (SIC 3546)	Rolling mill machinery (SIC 3547)	Welding apparatus (SIC 3548)	Metalworking machinery, n.e.c. (SIC 3549)
Gross book value of depreciable assets:									
Total:									
Beginning of year	1 419.3	576.3	184.2	3 434.9	1 600.3	651.4	204.8	602.4	302.4
New capital expenditures ¹	61.1	31.2	18.5	375.3	113.2	46.2	7.1	45.4	21.4
Used capital expenditures	5.6	3.3	4.1	79.8	19.8	3.0	1.0	8.6	8.5
Retirements	79.1	16.4	4.2	43.1	162.7	52.9	17.4	14.6	6.8
End of year	1 407.1	594.5	202.6	3 846.9	1 570.6	647.7	195.5	641.7	325.4
Buildings and other structures:									
Beginning of year	389.4	152.9	24.9	590.4	359.7	126.8	50.0	201.7	99.7
New capital expenditures	12.2	2.4	3.4	64.2	14.5	2.5	1.6	10.7	5.2
Used capital expenditures	1.7	1.2	1.7	23.4	5.1	.5	.2	.9	.5
Retirements	4.1	.7	.3	9.2	25.9	15.9	4.5	.3	.7
End of year	399.3	155.8	29.7	668.7	353.4	113.8	47.3	213.0	104.8
Machinery and equipment:									
Beginning of year	1 030.0	423.4	159.3	2 844.5	1 240.6	524.6	154.8	400.7	202.6
New capital expenditures ¹	49.0	28.8	15.1	311.1	98.7	43.7	5.5	34.7	16.1
Used capital expenditures	3.9	2.2	2.5	56.4	14.7	2.5	.8	7.7	8.0
Retirements	75.0	15.7	3.9	33.9	136.7	36.9	12.9	14.3	6.1
End of year	1 007.8	438.7	172.9	3 178.2	1 217.2	533.9	148.2	428.7	220.6
Depreciation charges during 1987:									
Total	85.7	34.6	17.9	308.6	130.0	53.3	10.8	41.0	23.8
Buildings and other structures	14.7	5.2	1.7	30.0	17.0	4.3	1.5	8.4	4.4
Machinery and equipment	70.9	29.4	16.2	278.6	113.0	49.0	9.3	32.6	19.4
Rental payments:									
Total	25.2	10.2	7.9	122.2	38.1	7.4	3.5	16.1	12.0
Buildings and other structures	8.0	4.6	3.6	56.8	13.8	1.9	1.1	9.1	5.8
Machinery and equipment	17.2	5.6	4.3	65.4	24.3	5.4	2.4	7.0	6.2

Note: Retirements and depreciation data for establishments not included in the ASM sample were extrapolated from the historical ratio of retirements or depreciation to assets. These ratios were developed at the industry level.

¹Data on new machinery and equipment expenditures by type are provided in table 3c.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tools, metal cutting types (SIC 3541)		Machine tools, metal forming types (SIC 3542)		Industrial patterns (SIC 3543)		Special dies, tools, jigs, and fixtures (SIC 3544)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:								
Cost of purchased services for the repair of-								
Buildings and other structures	4.7	(X)	2.9	(X)	1.0	(X)	16.7	(X)
Response coverage ratio (percent) ²	70.9	(X)	74.9	(X)	54.8	(X)	50.0	(X)
Machinery	10.8	(X)	9.3	(X)	2.8	(X)	40.1	(X)
Response coverage ratio (percent) ²	70.9	(X)	79.5	(X)	54.8	(X)	52.7	(X)
Cost of purchased communication services	11.7	(X)	5.3	(X)	(S)	(X)	12.8	(X)
Response coverage ratio (percent) ²	72.9	(X)	82.6	(X)	(S)	(X)	51.9	(X)
New machinery and equipment expenditures	49.0	(X)	28.8	(X)	15.1	(X)	311.1	(X)
Automobiles, trucks, etc., for highway use	1.3	11	1.2	36	2.1	70	14.2	17
Computers and peripheral data processing equipment	8.4	9	5.3	26	2.6	66	28.0	15
All other	39.2	3	22.3	7	10.5	18	268.9	3
Adjustment ratio ³	1.1	(X)	1.1	(X)	1.4	(X)	1.4	(X)
Cost of materials, components, parts, etc., used	1 151.4	(X)	542.9	(X)	91.4	(X)	1 638.1	(X)
Materials purchased or transferred from foreign sources ⁴	125.6	6	41.6	40	(S)	1	22.4	12
Materials purchased or transferred from domestic sources	1 025.9	1	501.3	4	(S)	1	1 615.7	1
Adjustment ratio ³	1.5	(X)	1.5	(X)	(S)	(X)	1.7	(X)

Item	Machine tool accessories (SIC 3545)		Power-driven handtools (SIC 3546)		Rolling mill machinery (SIC 3547)		Welding apparatus (SIC 3548)		Metalworking machinery, n.e.c. (SIC 3549)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:										
Cost of purchased services for the repair of-										
Buildings and other structures	5.1	(X)	1.6	(X)	.7	(X)	2.3	(X)	1.5	(X)
Response coverage ratio (percent) ²	63.4	(X)	76.8	(X)	66.7	(X)	52.6	(X)	53.7	(X)
Machinery	17.0	(X)	5.9	(X)	2.3	(X)	5.9	(X)	2.2	(X)
Response coverage ratio (percent) ²	68.3	(X)	82.3	(X)	68.1	(X)	57.6	(X)	52.5	(X)
Cost of purchased communication services	9.0	(X)	4.8	(X)	1.4	(X)	6.1	(X)	3.0	(X)
Response coverage ratio (percent) ²	66.5	(X)	75.3	(X)	74.6	(X)	58.2	(X)	51.0	(X)
New machinery and equipment expenditures	98.7	(X)	43.7	(X)	5.5	(X)	34.7	(X)	16.1	(X)
Automobiles, trucks, etc., for highway use	3.7	13	.2	4	.1	11	1.5	8	1.3	16
Computers and peripheral data processing equipment	8.2	13	2.3	14	1.8	10	5.0	5	4.0	18
All other	86.8	2	41.2	1	3.6	6	28.1	1	10.9	7
Adjustment ratio ³	1.4	(X)	1.1	(X)	1.2	(X)	1.3	(X)	1.9	(X)

See footnotes at end of table.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Machine tool accessories (SIC 3545)		Power-driven handtools (SIC 3546)		Rolling mill machinery (SIC 3547)		Welding apparatus (SIC 3548)		Metalworking machinery, n.e.c. (SIC 3549)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Cost of materials, components, parts, etc., used	800.6	(X)	846.6	(X)	192.8	(X)	899.8	(X)	394.7	(X)
Materials purchased or transferred from foreign sources ²	63.5	21	136.4	4	6.6	4	173.9	4	16.6	14
Materials purchased or transferred from domestic sources	737.1	3	710.2	1	186.2	1	725.8	1	378.1	1
Adjustment ratio ³	1.2	(X)	1.2	(X)	1.5	(X)	1.4	(X)	1.8	(X)

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

²Measure of extent to which respondents reported each item. Derived for each item by calculating the ratio of weighted employment for those sample establishments that reported the specific inquiry to total employment for all establishments classified in industry. (See appendixes for explanation of sample weight.)

³Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response to the inquiry. (See appendixes for further explanation.)

⁴Data may understate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.

Table 4. Industry Statistics by Employment Size of Establishment: 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All estab- lish- ments (no.)	All employees		Production workers			Value added by manufac- ture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expend- itures (million dollars)	End-of- year invento- ries (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES												
Total	-	417	31.7	921.5	18.2	35.4	465.7	1 668.7	1 399.5	3 189.5	61.1	1 056.8
Establishments with an average of—												
1 to 4 employees	E2	22	.1	1.5	(Z)	.1	.8	(S)	7.3	6.0	.1	1.1
5 to 9 employees	E2	52	.4	9.7	.2	.5	6.1	14.8	12.6	27.3	.7	6.8
10 to 19 employees	E1	111	1.5	38.5	1.0	2.0	23.3	67.0	51.1	118.0	2.7	29.3
20 to 49 employees	E1	111	3.4	92.5	2.1	4.4	51.4	223.0	213.2	450.4	7.6	98.9
50 to 99 employees	E1	58	3.8	109.8	2.2	4.7	55.4	173.5	181.5	367.5	8.0	119.1
100 to 249 employees	-	36	5.7	167.3	3.3	6.8	83.7	287.8	286.6	594.4	14.3	201.8
250 to 499 employees	-	17	6.0	182.9	3.2	6.4	82.8	320.3	302.3	669.1	4.6	275.1
500 to 999 employees	-	6	4.2	18.7	2.5	4.8	64.4	227.5	135.7	363.3	9.8	167.8
1,000 to 2,499 employees	-	3	6.6	200.5	3.4	5.8	97.6	360.9	209.2	593.6	13.3	156.9
2,500 employees or more	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES												
Total	E1	207	13.8	414.3	8.7	18.1	236.7	734.3	637.8	1 396.3	31.2	529.3
Establishments with an average of—												
1 to 4 employees	E5	5	(Z)	.3	(Z)	(Z)	.3	.5	.3	.8	(Z)	.2
5 to 9 employees	E1	19	.1	3.8	.1	.2	2.6	6.1	4.2	10.2	.1	2.8
10 to 19 employees	E3	63	.9	22.9	.6	1.2	14.1	40.2	29.9	72.0	1.7	17.3
20 to 49 employees	E2	49	1.6	41.8	1.0	2.1	24.6	76.0	58.6	135.6	2.3	37.3
50 to 99 employees	E1	38	2.9	82.1	1.8	3.8	45.8	163.0	172.9	327.6	9.8	118.0
100 to 249 employees	E1	22	3.2	101.1	2.0	4.5	58.9	189.9	208.7	399.3	6.0	109.1
250 to 499 employees	-	8	3.0	94.6	1.8	3.8	52.5	116.3	98.8	259.0	6.1	167.3
500 to 999 employees	-	3	2.1	67.8	1.2	2.5	38.0	142.4	64.4	191.8	5.2	77.3
INDUSTRY 3543, INDUSTRIAL PATTERNS												
Total	E1	813	8.6	237.5	6.9	13.8	186.4	389.3	112.5	499.4	18.5	43.0
Establishments with an average of—												
1 to 4 employees	E8	311	.7	15.4	.5	1.1	12.2	26.8	10.0	36.8	.9	1.9
5 to 9 employees	E3	251	1.7	40.9	1.4	2.8	33.1	68.4	20.4	89.1	3.2	4.4
10 to 19 employees	E1	166	2.2	60.2	1.8	3.5	46.8	95.9	27.5	122.9	3.3	8.7
20 to 49 employees	E1	67	1.8	51.2	1.4	3.0	40.9	75.4	28.2	105.0	4.1	10.0
50 to 99 employees	-	10	.7	25.8	.5	1.1	20.3	43.3	9.4	52.1	1.7	6.3
100 to 249 employees	-	6	1.5	43.9	1.1	2.3	33.1	79.5	17.1	93.6	5.3	11.8
250 to 499 employees	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	358	1.1	20.7	.9	1.7	16.3	36.7	13.6	50.3	1.4	2.6

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES												
Total -----	E1	7 317	114.4	3 163.6	87.7	185.5	2 251.2	5 293.8	2 227.0	7 550.1	375.3	952.1
Establishments with an average of—												
1 to 4 employees -----	E8	2 430	5.3	110.2	4.3	8.3	79.1	199.5	71.0	270.3	8.1	31.7
5 to 9 employees -----	E3	1 747	11.8	265.6	9.1	19.0	198.1	449.7	169.2	616.6	29.7	68.7
10 to 19 employees -----	E1	1 623	22.2	556.4	17.1	34.8	413.0	926.0	367.1	1 290.1	62.4	127.8
20 to 49 employees -----	E1	1 106	33.0	917.3	25.3	54.6	658.8	1 474.7	619.9	2 136.2	91.6	256.7
50 to 99 employees -----	E1	291	19.6	609.2	15.0	33.0	430.6	1 082.0	424.9	1 491.1	71.6	210.6
100 to 249 employees -----	E1	105	15.0	425.8	11.4	24.7	292.9	750.6	384.7	1 130.7	53.9	186.6
250 to 499 employees -----	-	12	7.5	279.0	5.6	11.2	178.8	411.3	190.0	615.2	58.1	69.9
500 to 999 employees -----	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1,000 to 2,499 employees -----	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ² -----	E9	2 929	9.7	167.8	7.8	15.4	119.2	301.0	106.9	408.0	12.0	47.8
INDUSTRY 3545, MACHINE TOOL ACCESSORIES												
Total -----	E1	1 879	48.4	1 184.4	35.0	71.0	756.8	2 560.8	1 038.1	3 594.8	113.2	812.1
Establishments with an average of—												
1 to 4 employees -----	E9	592	1.3	24.9	.9	1.8	16.1	54.4	18.8	74.1	1.5	14.9
5 to 9 employees -----	E7	405	2.7	53.0	2.0	3.9	34.6	110.6	39.8	150.8	3.2	30.9
10 to 19 employees -----	E3	318	4.4	93.2	3.1	6.2	59.6	183.2	71.6	257.4	6.5	44.4
20 to 49 employees -----	E2	333	10.2	252.2	7.5	15.5	165.5	555.6	213.5	767.6	20.0	130.4
50 to 99 employees -----	E2	135	9.2	223.8	6.7	13.5	140.0	488.9	228.2	712.2	19.5	167.1
100 to 249 employees -----	E1	70	10.1	254.3	7.3	14.8	163.7	542.2	236.9	767.0	25.8	184.1
250 to 499 employees -----	-	22	7.8	205.0	5.4	11.1	123.6	476.5	159.2	646.7	24.2	149.7
500 to 999 employees -----	-	3	2.9	78.1	2.1	4.3	53.8	149.6	70.1	219.1	12.5	90.6
1,000 to 2,499 employees -----	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ² -----	E9	909	3.9	64.5	2.8	5.3	41.9	140.6	47.9	188.5	3.9	38.2
INDUSTRY 3546, POWER-DRIVEN HANDTOOLS												
Total -----	-	199	16.8	382.8	11.7	22.3	222.3	1 125.0	1 045.9	2 161.8	46.2	361.2
Establishments with an average of—												
1 to 4 employees -----	E9	65	.1	2.2	.1	.2	1.3	5.8	5.3	11.1	.3	2.0
5 to 9 employees -----	E8	35	.2	5.0	.2	.3	3.1	14.3	11.5	25.8	.7	4.1
10 to 19 employees -----	E7	31	.4	9.5	.3	.6	5.4	22.2	18.6	40.9	1.2	7.2
20 to 49 employees -----	E4	22	.7	15.5	.5	.9	8.5	33.9	34.0	67.5	1.9	13.1
50 to 99 employees -----	E1	12	.8	15.4	.6	1.1	9.8	31.4	27.9	60.1	.8	12.6
100 to 249 employees -----	-	14	2.3	59.1	1.5	3.3	32.1	138.1	73.0	216.7	8.2	68.3
250 to 499 employees -----	-	9	3.1	84.6	2.3	4.4	49.6	198.8	257.9	455.7	8.1	61.5
500 to 999 employees -----	-	9	9.1	191.6	6.3	11.6	112.4	680.5	617.7	1 284.1	25.0	192.4
1,000 to 2,499 employees -----	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ² -----	E9	115	.7	13.4	.5	.9	8.3	35.8	31.8	67.6	1.9	11.5
INDUSTRY 3547, ROLLING MILL MACHINERY												
Total -----	-	86	3.9	120.7	2.2	4.7	57.4	284.9	249.7	467.8	7.1	170.6
Establishments with an average of—												
1 to 4 employees -----	E9	21	(Z)	1.0	(Z)	.1	.5	1.6	1.8	3.4	(Z)	.7
5 to 9 employees -----	E7	16	.1	2.6	.1	.2	1.5	3.9	4.1	8.2	.1	1.5
10 to 19 employees -----	E2	15	.2	4.4	.1	.3	2.5	7.3	8.2	15.6	.4	4.4
20 to 49 employees -----	E2	15	.5	12.7	.3	.6	6.1	22.4	19.0	39.9	.3	8.0
50 to 99 employees -----	-	10	.7	18.6	.4	1.0	11.3	42.4	43.2	90.6	.5	11.7
100 to 249 employees -----	-	5	.8	23.9	.6	1.1	15.0	41.6	33.0	70.0	2.9	16.7
250 to 499 employees -----	-	3	1.7	57.6	.7	1.6	20.5	165.6	140.5	240.0	2.8	127.5
500 to 999 employees -----	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ² -----	E9	32	.2	3.8	.1	.2	1.8	6.2	7.6	13.8	.2	3.2
INDUSTRY 3548, WELDING APPARATUS												
Total -----	-	225	18.7	541.5	11.5	24.2	292.9	1 084.4	1 062.1	2 104.6	45.4	556.4
Establishments with an average of—												
1 to 4 employees -----	E8	36	.1	1.5	.1	.1	.8	3.6	3.1	6.7	.1	1.5
5 to 9 employees -----	E7	22	.1	3.3	.1	.2	1.9	8.1	6.0	14.1	.2	2.3
10 to 19 employees -----	E6	37	.5	12.0	.3	.6	6.4	26.7	21.9	49.1	2.1	11.4
20 to 49 employees -----	E2	49	1.5	41.6	1.0	2.0	22.1	91.0	72.9	162.2	3.4	32.5
50 to 99 employees -----	E2	35	2.6	72.9	1.6	3.5	37.5	150.8	128.5	279.6	5.7	73.5
100 to 249 employees -----	-	29	4.5	123.1	2.6	5.7	68.4	198.0	289.2	477.5	7.3	189.9
250 to 499 employees -----	-	12	3.9	105.0	2.3	4.4	49.0	254.0	190.7	438.0	7.0	86.4
500 to 999 employees -----	-	3	5.5	182.1	3.6	7.7	106.9	352.2	349.9	677.4	19.6	158.8
1,000 to 2,499 employees -----	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ² -----	E9	72	.6	11.9	.4	.8	6.5	25.5	21.2	46.7	.7	9.2

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1987—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.												
Total	E1	302	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4	265.8
Establishments with an average of—												
1 to 4 employees	E8	54	.1	2.3	.1	.1	1.2	2.1	3.3	8.3	.2	1.8
5 to 9 employees	E8	41	.3	5.7	.2	.3	3.3	10.3	7.1	17.0	.4	3.9
10 to 19 employees	E3	60	.8	20.2	.5	1.1	12.0	34.7	24.4	62.3	.9	11.8
20 to 49 employees	E2	75	2.2	60.2	1.4	2.9	33.5	110.6	90.9	200.5	3.3	40.0
50 to 99 employees	E1	49	3.5	101.9	2.2	4.6	54.4	176.4	141.6	316.0	5.9	96.1
100 to 249 employees	-	17	2.5	79.4	1.7	3.5	48.1	129.5	107.0	245.6	4.5	61.2
250 to 499 employees	-	6	2.0	69.1	1.0	2.0	29.3	129.6	77.3	205.3	6.2	50.9
Covered by administrative records ²	E9	90	.4	7.6	.3	.5	4.2	14.5	10.3	24.9	.5	5.7

Note: For qualifications of data, see footnotes on table 1a-1. Data shown as a (D) are included in underscored figures above.

¹Payroll and sales data for some small single unit companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single unit companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1987 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3541	Machine tools, metal cutting types:										
	All establishments in industry	417	31.7	921.5	18.2	35.4	465.7	1 668.7	1 399.5	3 189.5	61.1
	Establishments with this product class primary:										
3541D	Boring machines and drilling machines	25	1.6	50.1	.9	2.1	26.7	81.7	68.8	162.7	1.4
35413	Gear cutting machines	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35414	Grinding, polishing, buffing, honing, and lapping machines	63	5.6	163.4	3.1	6.6	80.8	276.5	202.7	499.9	9.5
35415	Lathes	20	3.4	96.1	2.0	3.7	47.0	185.2	167.0	347.0	7.7
35416	Milling machines	11	2.6	77.4	1.6	2.4	38.3	137.8	139.6	286.5	3.0
35418	Machine tools home workshops	23	1.2	32.4	.7	1.4	15.4	69.0	56.5	125.1	3.4
35419	Parts for metal cutting type machine tools	74	6.5	187.6	3.7	6.9	95.9	332.0	233.8	592.0	9.8
3541A	Machining centers	18	1.9	52.8	.9	1.9	24.6	122.8	137.7	261.1	2.8
3541B	Station type machines	16	3.0	101.6	1.8	3.4	53.3	199.2	191.7	440.6	6.7
3541C	Metal cutting machine tools, n.e.c.	61	2.5	70.3	1.5	3.1	35.8	116.6	128.2	244.1	6.9
3542	Machine tools, metal forming types:										
	All establishments in industry	207	13.8	414.3	8.7	18.1	236.7	734.3	637.8	1 396.3	31.2
	Establishments with this product class primary:										
35421	Punching, shearing, bending, and forming machines ..	61	4.1	125.2	2.4	4.9	63.7	234.5	228.5	466.9	11.4
35422	Presses, except forging and die-stamping	38	4.3	130.2	2.8	5.8	74.5	195.9	181.1	402.4	4.3
35423	Other metal forming machine tools, n.e.c.	31	2.4	73.3	1.5	3.3	44.5	137.4	127.5	263.5	6.9
35424	Parts for metal forming machine tools	44	2.2	65.5	1.5	3.1	42.2	132.5	76.1	204.9	7.7
3543	Industrial patterns:										
	All establishments in industry	813	8.6	237.5	6.9	13.8	186.4	389.3	112.5	499.4	18.5
3544	Special dies, tools, jigs, and fixtures:										
	All establishments in industry	7 317	114.4	3 163.6	87.7	185.5	2 251.2	5 293.8	2 227.0	7 550.1	375.3
	Establishments with this product class primary:										
35441	Special dies and tools, die sets, jigs, and fixtures	1 880	53.2	1 581.7	40.0	85.0	1 095.3	2 657.1	1 156.7	3 811.0	209.6
35442	Industrial molds and mold boxes	1 252	30.8	920.0	23.9	51.8	678.2	1 479.1	645.8	2 159.1	112.2
3545	Machine tool accessories:										
	All establishments in industry	1 879	48.4	1 184.4	35.0	71.0	756.8	2 560.8	1 038.1	3 594.8	113.2
	Establishments with this product class primary:										
35451	Small cutting tools for machine tools and metalworking machinery	440	25.9	633.2	19.4	39.6	419.4	1 455.4	584.5	2 030.2	64.7
35454	Machine tool attachments and accessories, n.e.c.	134	6.3	169.7	4.3	8.9	105.7	342.1	142.7	486.2	12.0
35455	Precision measuring tools	88	6.0	173.4	3.8	7.9	94.1	318.3	152.1	474.9	22.6
3546	Power-driven handtools:										
	All establishments in industry	199	16.8	382.8	11.7	22.3	222.3	1 125.0	1 045.9	2 161.8	46.2
	Establishments with this product class primary:										
35461	Power-driven handtools, electric (including battery-powered)	26	8.2	168.0	6.1	11.5	101.6	616.4	582.2	1 202.3	22.7
35462	Power-driven handtools, pneumatic, hydraulic, and powder-actuated	33	5.2	144.5	3.3	6.6	81.5	316.2	181.3	487.6	16.5
35463	Power-driven handtools, engine (internal combustion) driven	6	2.2	46.7	1.3	2.6	24.4	134.6	231.1	362.7	(D)

See footnotes at end of table.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1987—
Con.

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3547	Rolling mill machinery: All establishments in industry -----	86	3.9	120.7	2.2	4.7	57.4	284.9	249.7	467.8	7.1
	Establishments with this product class primary:										
35471	Hot rolling mill machinery (except tube rolling) -----	9	1.8	56.3	.9	1.8	22.3	163.8	135.3	237.5	3.3
35472	Cold rolling mill machinery -----	5	.6	17.7	.4	.8	11.3	34.8	30.3	62.2	2.1
35473	Rolling mill machinery, n.e.c., and parts -----	30	1.3	40.0	.8	1.7	20.3	74.7	70.2	142.5	1.4
3548	Welding apparatus: All establishments in industry -----	225	18.7	541.5	11.5	24.2	292.9	1 084.4	1 062.1	2 104.6	45.4
	Establishments with this product class primary:										
35481	Arc welding machines, components, and accessories -----	35	5.6	151.5	3.5	7.1	82.3	266.5	324.7	566.8	16.4
35482	Arc welding electrodes, metal -----	17	5.0	178.9	3.1	6.6	97.6	361.6	386.4	741.0	14.0
35483	Resistance welders, components, accessories, and electrodes -----	37	2.9	93.4	2.0	4.5	54.6	149.8	132.4	277.4	4.1
35484	Gas welding and cutting equipment -----	23	2.4	47.0	1.4	2.8	23.9	124.3	83.2	207.1	2.3
35485	Other welding equipment, except ultrasonic and laser -----	18	1.6	40.2	.8	1.6	17.4	116.3	78.9	189.9	5.7
3549	Metalworking machinery, n.e.c.: All establishments in industry -----	302	11.5	338.8	7.0	14.7	181.9	593.3	451.6	1 055.0	21.4
	Establishments with this product class primary:										
35492	Assembly machines -----	80	5.2	177.7	3.2	7.1	98.5	278.3	241.6	520.3	9.1
35495	Metalworking machinery, n.e.c. -----	61	3.6	104.1	2.0	4.2	48.8	208.6	139.9	355.3	8.2

Note: For qualifications of data, see footnotes on table 1a-1.

Table 5b. Industry-Product Analysis—Value of Shipments and Primary Product Shipments and Specialization and Coverage Ratios for the Industry: 1987 and Earlier Census Years

[An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work. Columns A-D show this product pattern for an industry, and column E shows primary product specialization ratio. The extent to which an industry's primary products are shipped by establishments classified in and out of an industry is shown in columns F-H and coverage ratio is shown in column I. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and product group code	Industry and census year	Value of shipments					Value of primary product shipments			
		Total (million dollars)	Primary products (million dollars)	Secondary products (million dollars)	Miscellaneous receipts (million dollars)	Primary product specialization ratio col. B ÷ col. E (percent)	Total made in all industries (million dollars)	Made in this industry (million dollars)	Made in other industries (million dollars)	Coverage ratio col. B ÷ col. F (percent)
		A	B	C	D	E	F	G	H	I
3541	Machine tools, metal cutting types -----									
	1987--	3 189.5	2 394.1	484.8	310.6	83	2 585.2	2 394.1	191.2	93
	1982--	4 440.2	3 877.2	369.5	193.6	91	4 154.7	3 877.2	277.5	93
	1977--	2 812.7	2 353.9	337.0	121.8	87	2 560.5	2 353.9	206.6	92
3542	Machine tools, metal forming types -----									
	1987--	1 396.3	1 186.1	116.7	93.5	91	1 370.3	1 186.1	184.3	87
	1982--	1 428.7	1 210.5	143.6	74.6	89	1 383.9	1 210.5	173.4	87
	1977--	1 130.6	967.1	111.6	51.9	90	1 114.7	967.1	147.6	87
3543	Industrial patterns -----									
	1987--	499.4	445.0	36.5	17.9	92	557.9	445.0	112.9	80
	1982--	452.3	428.8	13.4	10.1	97	561.5	428.8	132.7	76
	1977--	320.6	308.9	9.5	2.2	97	411.9	308.9	103.0	75
3544	Special dies, tools, jigs, and fixtures -----									
	1987--	7 550.1	6 678.0	418.8	453.2	94	8 142.8	6 678.0	1 464.8	82
	1982--	5 374.9	4 795.1	298.3	281.5	94	6 099.3	4 795.1	1 304.2	79
	1977--	3 905.3	3 498.4	219.0	187.9	94	4 450.2	3 498.4	951.8	79
3545	Machine tool accessories -----									
	1987--	3 594.8	3 162.9	211.2	220.8	94	3 417.8	3 162.9	255.0	93
	1982--	3 163.9	2 740.5	241.5	181.9	92	3 069.1	2 740.5	328.6	89
	1977--	2 383.0	1 969.9	254.2	158.9	89	2 238.9	1 969.9	269.0	88
3546	Power-driven handtools -----									
	1987--	2 161.8	1 609.5	335.6	216.6	83	1 886.1	1 609.5	276.6	85
	1982--	1 795.3	1 457.3	194.2	143.7	88	1 594.8	1 457.3	137.5	91
	1977--	1 623.2	1 349.8	126.0	147.5	91	1 496.5	1 349.8	146.7	90
3547	Rolling mill machinery -----									
	1987--	467.8	378.0	32.3	57.5	92	403.0	378.0	25.0	94
	1982--	502.9	352.5	91.7	58.7	79	445.1	352.5	92.6	79
	1977--	507.4	309.5	87.4	110.6	78	361.0	309.5	51.5	86
3548	Welding apparatus -----									
	1987--	2 104.6	1 772.3	200.1	132.2	90	1 918.0	1 772.3	145.7	92
3549	Metalworking machinery, n.e.c. -----									
	1987--	1 055.0	898.8	112.7	43.6	89	1 026.1	898.8	127.4	88

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3541- --	MACHINE TOOLS, METAL CUTTING TYPES						
	Total	(NA)	(X)	2 585.2	(NA)	(X)	4 154.7
3541D --	Boring machines (excluding machining centers) and drilling machines (excluding machining centers):						
3541D 00	Boring machines (excluding machining centers) and drilling machines (excluding machining centers) (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	56	(X)	157.0	72	(X)	266.0
35413 --	Gear cutting machines:						
35413 00	Gear cutting machines (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	10	(X)	62.4	11	(X)	87.3
35414 --	Grinding, polishing, buffing, honing, and lapping machines, except gear-tooth grinding, lapping, polishing, and buffing machines:						
35414 00	Grinding, polishing, buffing, honing, and lapping machines, except gear-tooth grinding, lapping, polishing, and buffing machines (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	98	(X)	396.1	90	(X)	515.3
35415 --	Lathes:						
35415 00	Lathes (turning machines) (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	43	(X)	266.5	45	(X)	523.6
35416 --	Milling machines:						
35416 00	Milling machines, excluding machining centers (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	30	(X)	197.2	34	(X)	264.5
3541A --	Machining centers:						
3541A 00	Machining centers (multifunction numerically controlled machines) (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	32	(X)	231.7	22	(X)	365.7
3541B --	Station type machines:						
3541B 00	Station type machines (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	30	(X)	316.4	34	(X)	735.4
3541C --	Other metal cutting machine tools:						
3541C 00	Other metal cutting machine tools (except those designed primarily for home workshops, laboratories, etc.), including broaching machines, planers, shapers (except gear shapers and slotters), sawing and cut-off machines, tapping machines, threading machines, spark erosion, ultrasonic, and electrolytic machines, n.e.c., etc. (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	95	(X)	189.1	94	(X)	250.6
35418 --	Machine tools designed primarily for home workshops, laboratories, garages, etc. (metalworking and primarily metalworking only)	(NA)	(X)	97.2	(NA)	(X)	85.7
35418 11	Drilling machines	5	(S)	8.8	6	(S)	9.6
35418 31	Grinding and polishing machines, including crankshaft regrinding and valve grinding machines	13	(S)	22.6	17	(S)	26.5
35418 51	Lathes	3	(S)	11.0	9	(S)	9.0
35418 71	Sawing and cut-off machines	10	(S)	17.5			
35418 91	Other metalworking (or primarily metalworking) types, including automotive cylinder reboring machines	14	(S)	30.8	19	(S)	40.3
35418 00	Machine tools designed primarily for home workshops, laboratories, garages, etc. (metalworking and primarily metalworking only), n.s.k.	(NA)	(X)	6.6	(NA)	(X)	.3
35419 --	Parts for metal cutting type machine tools, sold separately, and rebuilt metal cutting type machine tools	(NA)	(X)	577.5	(NA)	(X)	891.9
35419 11	Parts for metal cutting machine tools, sold separately	124	(X)	380.3	206	(X)	725.3
35419 21	Rebuilt metal cutting type machine tools:						
35419 22	Spark erosion, ultrasonic, and electrolytic machines	3	(D)	(³)			
35419 23	Machining centers and multitasking machines	10	(S)	44.5			
35419 24	Lathes	17	(S)	46.4			
35419 25	Drilling, threading, milling, boring, or tapping machines	27	(S)	31.1	65	(X)	153.9
35419 26	Deburring, sharpening, grinding, honing, lapping, and other finishing machines	15	(S)	16.6			
35419 27	Other rebuilt metal cutting machine tools	13	(S)	35.7			
35419 00	Parts for metal cutting type machine tools, sold separately, and rebuilt metal cutting type machine tools, n.s.k.	(NA)	(X)	22.9	(NA)	(X)	12.7
35410 --	Machine tools, metal cutting types, n.s.k.	(NA)	(X)	94.2	(NA)	(X)	168.7
35410 00	Machine tools, metal cutting, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	94.2	(NA)	(X)	27.4
35410 02	Machine tools, metal cutting, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	-	(NA)	(X)	141.3

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

(Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For comparability of product classes and product codes between 1982 and 1987, see appendix. For meaning of abbreviations and symbols, see introductory text.)

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3542--	MACHINE TOOLS, METAL FORMING TYPES				
	Total	(NA)	1 370.3	(NA)	1 383.9
35421 --	Punching, shearing, bending, and forming machines:				
35421 00	Punching and shearing machines (including power and manual) and bending and forming machines (power only) (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	94	334.4	94	317.3
35422 --	Presses, except forging and die stamping:				
35422 00	Metalworking presses (except forging and die stamping presses) (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	60	268.9	76	369.2
35423 --	Other metal forming machine tools, including forging and die stamping machines:				
35423 00	Other metal forming machine tools, including forging and die stamping machines, thread rolling machinery, die casting machines, riveting machines (except handheld portable types), can, barrel, and drum metal container making machines, etc. (for additional detail, see Current Industrial Report MQ-35W, Metalworking Machinery)	66	307.0	74	217.0
35424 --	Parts for metal forming machine tools and rebuilt metal forming machine tools	(NA)	392.9	(NA)	380.0
35424 01	Parts for metal forming machine tools (sold separately):				
35424 02	For die casting machines	9	12.2	141	318.0
35424 02	For other metal forming machine tools	91	307.9		
35424 03	Rebuilt metal forming machine tools:				
35424 04	Die casting machines	2	(⁴)	24	60.0
35424 04	Machines, including presses, for working metal by hammering, forging, die stamping, bending, folding, straightening, flattening, pinching, shearing, or notching	18	23.9		
35424 05	Other rebuilt metal forming machine tools	7	424.3		
35424 00	Parts for metal forming machine tools and rebuilt metal forming machine tools, n.s.k.	(NA)	24.6	(NA)	2.0
35420 --	Machine tools, metal forming types, n.s.k.	(NA)	67.3	(NA)	100.5
35420 00	Machine tools, metal forming types, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	67.3	(NA)	56.9
35420 02	Machine tools, metal forming types, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	-	(NA)	43.6
3543--	INDUSTRIAL PATTERNS				
	Total	(NA)	557.9	(NA)	561.5
35430 --	Industrial patterns, except shoe patterns:				
35430 11	Foundry patterns	435	341.5	562	350.1
35430 98	All other industrial patterns (except shoe patterns)	119	83.1	218	133.8
35430 00	Industrial patterns, n.s.k., typically for establishments with 5 employees or more (see note)	(NA)	83.1	(NA)	45.2
35430 02	Industrial patterns, n.s.k., typically for establishments with less than 5 employees (see note)	(NA)	50.3	(NA)	32.4
3544--	SPECIAL DIES, TOOLS, JIGS, AND FIXTURES				
	Total	(NA)	8 142.8	(NA)	6 099.3
35441 --	Special dies and tools, die sets, jigs, and fixtures	(NA)	4 219.7	(NA)	3 425.9
	Jigs and fixtures, all types:				
	Gauging and checking types:				
35441 13	Less than 1,000 lb weight	285	187.3	234	157.4
35441 15	1,000 lb weight or more	60	47.5	53	48.3
	All other jigs and fixtures (holding, positioning, layout, assembly, etc.):				
35441 17	Less than 1,000 lb weight	401	284.5	440	258.6
35441 18	1,000 lb weight or more	136	168.1	141	330.9
35441 19	Standard catalog components and parts for jigs and fixtures, including drill bushings	44	127.8	35	57.7
	Dies, metalworking only:				
35441 21	Press brake dies	37	31.2	32	23.9
	Forming and drawing dies:				
35441 22	500 lb weight or less	208	103.8	178	86.6
35441 24	501 to 3,000 lb weight	230	198.7	195	96.6
35441 26	More than 3,000 lb weight	148	311.8	111	212.7
	Stamping dies, including lamination and blanking dies:				
	Progressive type dies:				
35441 27	High speed steel	467	296.0	533	342.5
35441 28	Carbide	96	75.1	108	88.0
35441 25	Other	242	157.5	496	611.1
35441 23	All other stamping type dies (punch, trim, notch, pierce, perforate, etc.)	379	543.0		
	Forging dies, including cold forging and heading:				
35441 33	Open die type	42	43.8	49	26.2
35441 35	Closed die type	98	102.2	80	79.2
	Extrusion and wiredrawing and straightening dies:				
35441 43	High speed steel	30	45.1	62	60.8
35441 45	Carbide	34	34.3	36	31.6
35441 42	Ceramic and ceramic composite	1	.3	(⁵)	(⁵)
35441 44	Other	32	56.2	(⁵)	(⁵)

See footnotes at end of table.

Table 6a-1. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3544- --	SPECIAL DIES, TOOLS, JIGS, AND FIXTURES—Con.				
35441 --	Special dies and tools, die sets, jigs, and fixtures—Con. Dies, metalworking only—Con. All other dies:				
35441 46	High speed steel.....	74	41.8	67	42.3
35441 47	Carbide.....	48	52.0	43	40.1
35441 48	Other.....	100	62.2	581	560.8
35441 73	Standard and special components and parts for dies:				
	Die sets.....	59	91.3	43	78.2
	Standard punches:				
35441 75	Steel.....	86	130.1	60	68.6
35441 77	Carbide.....	24	10.3	29	11.5
35441 78	Other.....	102	124.5	57	79.3
35441 83	Industrial models and prototypes.....	217	267.6	325	350.6
35441 89	Other specially designed tooling.....	275	354.2		
35441 00	Special dies and tools, die sets, jigs, and fixtures, n.s.k.....	(NA)	271.4		
35442 --	Industrial molds and mold boxes.....	(NA)	2 523.2	(NA)	1 800.6
	Industrial molds made of metal:				
	Molds for metal or metal carbides (except ingot molds):				
35442 11	Injection or compression types (die casting dies).....	273	265.9	304	213.2
35442 13	Other types.....	55	36.6	49	40.6
	Molds for wax:				
35442 15	Injection or compression types.....	71	61.7	81	56.2
35442 16	Other types.....	11	3.6		
	Molds for mineral materials:				
35442 17	Injection or compression types.....	10	(⁶)	(7)	(7)
35442 18	Other types.....	3	627.6		
	Molds for glass:				
35442 19	Injection or compression types.....	18	107.4	118	104.8
35442 23	Other types.....	4	2.6		
	Molds for rubber:				
35442 41	Injection or compression types.....	104	104.8	118	104.8
35442 42	Other types.....	38	42.1		
	Molds for plastics:				
35442 51	Injection types.....	1 181	1 378.3	1 084	1 008.0
35442 55	Compression types, including matched metal molds.....	142	114.9	118	79.3
35442 59	All other types, including transfer, plunger, and rotational molds.....	137	129.1	119	68.5
35442 45	Molds for other materials.....	51	60.1	765	7143.2
35442 47	Mold bases.....	31	40.5		
35442 63	Industrial molds made of materials other than metal.....	41	48.3	40	39.5
35442 67	Mold boxes or flasks for use with patterns and sand molds in foundries.....	9	7.1	(7)	(7)
35442 00	Industrial molds and mold boxes, n.s.k.....	(NA)	92.6	(NA)	47.3
35440 --	Special dies, tools, jigs, and fixtures, n.s.k.....	(NA)	1 399.9	(NA)	872.8
35440 00	Special dies, tools, jigs, and fixtures, n.s.k., typically for establishments with 5 employees or more (see note).....	(NA)	988.2	(NA)	501.7
35440 02	Special dies, tools, jigs, and fixtures, n.s.k., typically for establishments with less than 5 employees (see note).....	(NA)	411.7	(NA)	371.1
3545- --	MACHINE TOOL ACCESSORIES				
	Total.....	(NA)	3 417.8	(NA)	3 069.1
35451 --	Small cutting tools for machine tools and metalworking machinery.....	(NA)	1 880.8	(NA)	1 755.7
35451 14	Broaches (excluding holders and burnishing bars).....	35	83.1	39	85.9
	Twist drills (excluding combined drills, countersinks, and gun drills):				
	Carbon steel and high speed steel:				
35451 16	1/2 in. or less diameter, taper shank.....	14	14.8	14	30.7
35451 17	1/2 in. or less diameter, straight shank.....	26	168.9	24	133.6
35451 18	More than 1/2 in. diameter, taper shank.....	16	19.1	12	12.6
35451 19	More than 1/2 in. diameter, straight shank.....	20	28.0	17	31.3
35451 24	Carbide, solid and tipped (excludes tips and blanks sold separately and masonry drills).....	32	50.9	25	35.5
35451 22	Masonry drill bits.....	14	40.0	12	27.6
35451 25	Gun drills and gun reamers.....	11	14.0	18	22.9
35451 26	Combination drills and countersinks.....	14	10.1	12	13.2
35451 27	Countersinks, including port cutters, etc. (excluding combined drills and countersinks and pilots for interchangeable pilot types).....	25	12.2	18	7.8
35451 29	Counterbores, including spot facers, etc. (excluding pilots for interchangeable pilot types).....	20	7.8	31	12.6
	Reamers (all types, but excluding gun reamers):				
35451 32	Carbon steel and high speed steel, including blades sold separately.....	26	30.9	31	28.5
35451 36	Carbide, solid and tipped (excluding tips and blanks sold separately), including replaceable blades sold separately.....	32	26.9	33	15.5
35451 42	Hobs, all types.....	5	(D)	8	32.0
35451 47	Gear shaper cutters and gear shaving cutters.....	9	47.5	9	35.6
	End mills and milling cutters:				
	End mills, solid and tipped, die-sinking, contour, router, tracer, hollow mills, etc. (excluding inserted blade types and shell mills):				
35451 51	High speed steel.....	36	97.4	37	92.2
35451 52	Carbide, solid and tipped (excluding blades sold separately).....	37	58.6	40	32.1
	Inserted blade type cutters, all types, complete:				
35451 53	Nonindexable.....	10	7.0	12	7.4
35451 54	Indexable or throwaway insert types.....	21	25.8	13	15.6
35451 58	Form relieved cutters, including high speed steel and carbide (solid and tipped).....	10	6.2	20	16.4
35451 59	Slitting saws and screw slotting cutters, including high speed steel and carbide (solid and tipped).....	14	15.2	12	10.9
	Milling cutters, n.e.c.::				
35451 61	High speed steel.....	16	46.1	19	49.0
35451 63	Carbide, solid and tipped (excluding tips and blanks sold separately).....	15	11.1	13	5.7

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3545- --	MACHINE TOOL ACCESSORIES—Con.				
35451 --	Small cutting tools for machine tools and metalworking machinery—Con.				
	Threading tools:				
	Taps (excluding taps in threading sets and screw plates and inserted chaser types):				
35451 77	Carbon steel and carbide	9	5.4	9	7.1
	High speed steel:				
35451 70	Cut thread	7	9.2	10	22.9
35451 71	Ground thread	21	111.6	23	92.5
35451 73	Dies, with two or more thread-forming edges integral with the body (including round, square, hexagonal, spring, two-piece, and adjustable types) (excluding inserted chaser types and dies sold in threading sets or screw plates)	8	19.9	8	23.1
35451 75	Chasers, single edge thread cutting, circular blade, and tangent types for mounting into or onto holders, die heads, and tap bodies (excluding all die heads, tap bodies, and chaser holders)	9	31.9	9	23.1
35451 87	Thread rolling dies, including circular, flat, and planetary	10	34.5	13	29.8
35451 89	Other threading tools, including screw plates and threading sets	8	6.4	11	14.0
	Single and double point tools ² :				
35451 65	High speed steel	15	10.7	27	12.7
35451 66	Carbide, solid and tipped (excluding rough blanks, and tips and blanks sold separately)	25	27.6	45	44.1
35451 68	Other materials	15	18.6	12	11.1
35451 72	Circular form tools, including semifinished blanks	16	43.7	16	29.7
	Blanks, tips, and inserts ³ :				
	Molded blanks and tips (excluding pressed-to-size inserts):				
35451 91	Carbide	30	85.2	28	74.0
35451 93	Other than carbide	6	10.2	8	10.5
	Inserts, indexable and throwaway types:				
	Carbide:				
35451 82	Utility ground	10	46.7	14	85.1
35451 83	Precision ground	38	172.9	42	149.7
35451 84	Pressed to size, including inserts with center holes and with molded chip breakers	12	(D)	13	84.5
35451 95	Ceramic	5	26.4	5	2.9
35451 96	Other than carbide and ceramic	7		7	2.9
	Inserts, other than indexable and throwaway types:				
35451 86	Carbide	14	20.6	15	22.3
35451 97	Ceramic	1			
35451 99	Other than carbide and ceramic	-	.6	8	7.2
	Other types of cutting tools for machine tools, n.e.c., including rotary burrs, rotary files, and spade drills:				
35451 92	Carbon steel	24	42.1	32	47.6
35451 94	High speed steel	34	35.1	50	53.2
35451 98	Carbide, solid and tipped (excluding tips and blanks sold separately)	52	72.4	62	52.1
35451 00	Small cutting tools for machine tools and metalworking machinery, n.s.k. ..	(NA)	107.7	(NA)	99.1
35454 --	Attachments and accessories for machine tools and metalworking machinery, n.e.c.	(NA)	542.6	(NA)	593.6
	Tool holders:				
35454 12	Turning tool holders, mechanically clamping for inserts and bits (except box tools and screw machine tool holders)	28	70.4	34	93.1
35454 14	Boring bars and heads	33	45.4	29	49.8
35454 17	Drilling, reaming, and tapping chucks	10	39.7	9	18.8
35454 31	Special tooling and attachments for screw and automatic machines (box tools, tool holders, turrets, rollers, etc.) except standard cutting bits and tools	17	9.6	19	19.3
35454 37	Die heads and tap bodies for chaser type threading and thread-rolling heads (excludes hand type die stocks)	8	10.4	5	5.1
35454 38	Other tool holders, including other chucks, drill heads, tool posts, turrets, sleeves, sockets, etc.	37	74.9	38	74.4
	Work holding devices:				
35454 45	Rotary tables and indexing work holders, including numerically controlled	13	27.5	17	34.7
35454 59	Other work holding and positioning devices, including vises, mandrels, feeding fingers and collets, clamps, stops, face plates, spacers, etc.	71	129.9	80	129.0
	Other attachments and accessories for machine tools and metalworking machinery, etc.:				
35454 41	Tracer and tapering attachments, safety devices, centers, dogs, work rests, chutes, etc. (excluding cutting tools, tool end work holders, jigs, fixtures, dies, and molds)	5	3.9	15	9.1
35454 43	Lathe chucks	10	17.7	7	24.2
35454 51	Tool room specialties, including levels, angle plates, parallels, sine bars, V-blocks, flats, etc.	7	5.3	69	115.5
35454 98	Other attachments and accessories	69	93.2		
35454 00	Attachments and accessories for machine tools and metalworking machinery, n.e.c., n.s.k.	(NA)	14.6	(NA)	20.7
35455 --	Precision measuring tools (inspection, quality control, tool room, and machinists')	(NA)	440.9	(NA)	402.7
35455 11	Comparators (excluding optical)	7	6.1	11	26.7
	Fixed size limit gauges (American Gauge Design Type C58-61):				
35455 13	Fixture type	25	28.4	27	18.5
35455 15	Thread type	23	30.4	20	30.9
35455 17	Adjustable size limit gauges	15	21.2	14	15.9
35455 21	Gauge blocks	6	6.0	5	6.6
35455 61	Dial indicators	8	16.2	7	23.1
35455 65	Micrometers and calipers	6	20.6	7	24.8
35455 71	Pneumatic and electronic gauges (manual and automatic)	12	94.8	23	94.9

See footnotes at end of table.

Table 6a-1. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3545--	MACHINE TOOL ACCESSORIES—Con.				
35455 --	Precision measuring tools (inspection, quality control, tool room, and machinists')—Con. Coordinate and contour measuring machines (inspection and gauging) and parts (sold separately): Complete units: _____				
35455 94	Conventional _____	4	56.6	12	55.2
35455 95	Numerically controlled _____	4			
35455 96	Parts _____	2	.4	(¹⁰)	(¹⁰)
35455 91	Gear checking instruments _____	-	-		
35455 92	Gear checking machines and parts (sold separately): Complete units _____	3	(D)	10	11.9
35455 93	Parts _____	3	(D)		
35455 81	Surface texture measuring machines and parts (sold separately): Complete units _____	4	(¹¹)	1030	1076.3
35455 83	Parts _____	1	117.8		
35455 97	Other machinists' precision measuring tools (including dividers) _____	23	97.9		
35455 98	Parts and accessories for machinists' precision measuring tools (sold separately) _____	9	21.7		
35455 00	Precision measuring tools, n.s.k. _____	(NA)	18.7	(NA)	17.9
35450 --	Machine tool accessories, n.s.k. _____	(NA)	553.6	(NA)	317.0
35450 00	Machine tool accessories, n.s.k., typically for establishments with 10 employees or more (see note) _____	(NA)	365.8	(NA)	217.7
35450 02	Machine tool accessories, n.s.k., typically for establishments with less than 10 employees (see note) _____	(NA)	187.8	(NA)	99.3
1987 product code	Product	1987		1982	
		Number of companies with shipments of \$100,000 or more	Product shipments ¹ Quantity ² Value (million dollars)	Number of companies with shipments of \$100,000 or more	Product shipments ¹ Quantity ² Value (million dollars)
3546--	POWER-DRIVEN HANDTOOLS				
	Total _____	(NA)	(X) 1 886.1	(NA)	(X) 1 594.8
35461 --	Power-driven handtools, electric (including battery powered) _____	(NA)	(X) 1 061.9	(NA)	(X) 829.9
	Drills:				
35461 01	Armature mounted primarily on sleeve bearings: 1/4 in. (6.35 mm) chuck size or less _____ thousands _____	1	4 926.6	6	3 403.6
35461 03	5/16 in. (7.94 mm) to less than 1/2 in. (12.70 mm) _____ do _____	4			
35461 04	1/2 in. (12.70 mm) or more _____ do _____	5			
	Armature mounted primarily on other than sleeve bearings:				
35461 05	1/4 in. (6.35 mm) chuck size or less _____ thousands _____	2	1 417.0	5	95.2
35461 07	5/16 in. (7.94 mm) to less than 1/2 in. (12.70 mm) _____ do _____	6			
35461 09	1/2 in. (12.70 mm) or more _____ do _____	6			
35461 22	Screwdrivers and nut-runners _____ do _____	7	2 601.9	5	147.9
35461 21	Hammers, percussion and rotary, without drill chuck _____ do _____	4	84.7	5	24.6
35461 23	Hammers—drills, with a drill chuck _____ do _____	4	(D)	7	83.0
35461 25	Impact wrenches _____ do _____	3	(D)	8	91.3
35461 28	Shears and nibblers _____ do _____	5	58.6	6	**38.0
35461 31	Planers _____ do _____	2			
35461 32	Routers _____ do _____	6	801.7	8	871.4
	Polishers, circular sanders, and grinders (except bench grinders):				
35461 26	Right-angle polishers, circular sanders, and grinders _____ thousands _____	5	765.2	10	848.7
35461 29	All other polishers, circular sanders, and grinders (including die grinders, but excluding bench) _____ do _____	5	641.2	10	117.2
	Sanders (except circular):				
35461 33	Belt _____ thousands _____	7	633.7	8	619.8
35461 34	Oscillating, reciprocating, and vibrating _____ do _____	6	1 041.9	7	568.0
	Saws, circular:				
35461 12	Armature mounted primarily on sleeve bearings _____ thousands _____	4	1 565.5	4	(D)
	Armature mounted primarily on other than sleeve bearings:				
35461 15	7 in. (177.80 mm) blade or less _____ thousands _____	2	1 429.0	4	26.9
35461 16	More than 7 in. (177.80 mm) to less than 8 in. (203.20 mm) blade _____ do _____	5			
35461 17	8 in. (203.20 mm) blade or more _____ do _____	4			
	Saws—jig, saber, reciprocating:				
35461 18	Armature mounted on ball bearings _____ thousands _____	6	714.3	9	1 916.6
35461 19	Armature mounted on other than ball bearings _____ do _____	4	1 415.6		
35461 37	Chain saws _____ do _____	4	384.0	4	(D)
35461 35	Other electric-powered handtools _____ do _____	18	(S)	18	(S)
35461 36	Parts, attachments, and accessories for electric-powered handtools (sold separately), excluding saw blades, drill bits, screwdrivers, motors, and switches _____	21	(X)	20	(X)
35461 00	Power-driven handtools, electric (including battery powered), n.s.k. _____	(NA)	(X) 5.8	(NA)	(X) 9.9

See footnotes at end of table.

Table 6a-1. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3546--	POWER-DRIVEN HANDTOOLS—Con.						
35462 --	Power-driven handtools, pneumatic, hydraulic, and powder-actuated -----	(NA)	(X)	508.5	(NA)	(X)	382.4
	Pneumatic: -----						
35462 38	Drills, screwdrivers, and nut-runners ----- thousands..	12	(S)	81.9	15	223.5	51.8
35462 37	Percussion tools (such as runners, riveters, chippers, scalars) ----- do..	7	(S)	24.0	15	(S)	22.7
35462 41	Impact wrenches ----- do..	7	(S)	40.3	11	253.4	45.7
	Grinders, polishers, and sanders: -----						
35462 42	Rotary ----- thousands..	13	(S)	52.9	14	438.2	41.2
35462 44	Other ----- do..	4	(S)	7.0			
35462 47	Other pneumatic-powered handtools ----- thousands..	20	(S)	134.5	35	(S)	66.8
35462 51	Parts, attachments, and accessories for pneumatic-powered handtools (sold separately), excluding drill bits, screwdrivers, etc. -----	18	(X)	113.0	24	(X)	110.3
35462 61	Powder-actuated handtools ----- thousands..	3	(S)	(14)	12	(S)	30.3
35462 71	Hydraulic: -----	1	(S)	148.0			
35462 72	Chain saws, including pole ----- thousands..	7	(S)	22.4			
35462 79	Other hydraulic-powered handtools ----- do..						
	Parts, attachments, and accessories for powder-actuated and hydraulic handtools (sold separately) (excluding saw blades, drill bits, etc.) -----	7	(X)	14.0	6	(X)	8.3
35462 00	Power-driven handtools, pneumatic, hydraulic, and powder-actuated, n.s.k. -----	(NA)	(X)	10.7	(NA)	(X)	5.3
35463 --	Power-driven handtools, engine (internal combustion) driven -----	(NA)	(X)	213.7	(NA)	(X)	326.5
35463 01	Chain saws ----- thousands..	4	(S)	162.1	6	3 123.8	211.5
35463 11	Other, including cut-off saws and drills ----- do..	2	(D)	(15)	4	(S)	12.6
	Parts, attachments, and accessories for engine-driven handtools, sold separately (excluding saw blades, drill bits, engines, engine parts, etc.): -----						
35463 12	For chain saws -----	4	(X)	1539.9	10	(X)	99.3
35463 14	For other than chain saws -----	3	(X)	8.1			
35463 00	Power-driven handtools, engine (internal combustion) driven, n.s.k. -----	(NA)	(X)	3.6	(NA)	(X)	3.2
35460 --	Power-driven handtools, n.s.k. -----	(NA)	(X)	101.9	(NA)	(X)	56.0
35460 00	Power-driven handtools, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	37.7	(NA)	(X)	25.0
35460 02	Power-driven handtools, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	64.2	(NA)	(X)	31.0
1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	
3547--	ROLLING MILL MACHINERY						
	Total -----	(NA)		403.0	(NA)		445.1
35471 --	Hot rolling mill machinery, including combination hot and cold (except tube rolling) -----	(NA)		175.3	(NA)		180.5
35471 11	Blooming and slabbing mill machinery -----	2	}	31.6	5	(16)	4.8
35471 13	Plate rolling mill machinery, except tin plate machinery -----	3			3		
35471 17	Hot strip mill machinery -----	3			5		1966.4
35471 18	Other hot rolling mill machinery and equipment -----	10		141.0	10		94.6
35471 00	Hot rolling mill machinery, including combination hot and cold (except tube rolling), n.s.k. -----	(NA)		2.6	(NA)		14.7
35472 --	Cold rolling mill machinery -----	(NA)		67.2	(NA)		65.1
35472 21	Tandem roll mills -----	4		11.3	5		5.9
35472 23	Single stand roll mills -----	5		8.2	5		15.6
35472 27	Double stand roll mills -----	1	}	44.2	11		41.2
35472 28	Other cold rolling mill machinery and equipment -----	6					
35472 00	Cold rolling mill machinery, n.s.k. -----	(NA)		3.5	(NA)		2.3
35473 --	Rolling mill machinery, n.e.c. (including tube mill machinery) and parts for all rolling mill machinery -----	(NA)		137.3	(NA)		188.2
35473 35	Tube mill machinery -----	11		21.3	14		95.7
35473 47	Processing lines, including pickling and cleaning, tinning, galvanizing, etc.. -----	2		(17)	16		91.3
35473 48	Other rolling mill machinery and equipment, excluding parts -----	6		1749.1			
35473 51	Machined rolls for rolling mills -----	13		47.1			
35473 52	Parts, excluding rolls, for rolling mill machinery (sold separately) -----	18		17.2			
35473 00	Rolling mill machinery, n.e.c. (including tube mill machinery) and parts for all rolling mill machinery, n.s.k. -----	(NA)		2.7	(NA)		1.2
35470 --	Rolling mill machinery, n.s.k. -----	(NA)		23.2	(NA)		11.4
35470 00	Rolling mill machinery, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)		10.4	(NA)		2.3
35470 02	Rolling mill machinery, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)		12.8	(NA)		9.1

See footnotes at end of table.

Table 6a-1. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3548--	WELDING APPARATUS						
	Total	(NA)	(X)	1 918.0	(NA)	(X)	1 606.6
35481 --	Arc welding machines, components, and accessories, except electrodes (excluding stud welding equipment)	(NA)	(X)	609.9	(NA)	(X)	511.6
	Arc welding machines:						
	Alternating current transformer arc welders:						
35481 01	300 amps or less	6	**183.4	37.2	9	(S)	27.1
35481 02	More than 300 amps	6	(S)	(¹⁹)	10	*1.0	20.8
	Direct current arc welders:						
35481 03	Generators only	3	(S)	(¹⁸)	11	(S)	137.7
35481 04	Rectifier types, including ac/dc	12	(S)	144.1			
	Complete units only:						
35481 05	Engine driven	3	41.7	78.5	5	41.1	79.6
35481 06	Motor driven	1	(S)	¹⁸ 104.7	4	4.3	5.5
	Components and accessories for arc welding machines (except electrodes):						
35481 07	Automatic and semiautomatic wire drive apparatus and related accessories	10	(X)	36.5	12	(X)	37.8
35481 08	Special purpose automatic welding apparatus	12	(X)	16.3	12	(X)	14.5
35481 09	Automatic and semiautomatic welding torches, guns and cables, and related accessories	12	(X)	57.4	13	(X)	50.8
35481 11	Circuit welding accessories (including electrode holders, ground clamps, cable connectors, cables sold separately, etc.)	6	(X)	23.0	7	(X)	22.6
35481 12	Positioning and manipulating equipment (including turn rolls, head-and-tail stock, weld head manipulators, seamers, moving carriages, etc.)	9	(X)	21.1	15	(X)	34.1
35481 19	All other components and accessories for arc welding machinery, excluding welding rods and electrodes	17	(X)	52.0	21	(X)	73.9
35481 00	Arc welding machines, components, and accessories, except electrodes (excluding stud welding equipment), n.s.k.	(NA)	(X)	39.1	(NA)	(X)	7.2
35482 --	Arc welding electrodes, metal	(NA)	(X)	494.4	(NA)	(X)	469.6
	Stick electrodes (including solid, cored, covered, and bare electrodes):						
	Hard facing:						
35482 01	Manual coated	6	(S)	17.4	11	(¹⁹)	(¹⁹)
35482 02	Bare rod for oxy-acetylene applications, TIG	3					
	Other than hard facing:						
35482 03	Mild steel	8	*270.2	136.6	10	371.9	180.3
35482 04	Low alloy steel	6					
35482 05	Stainless steel (chromium, 4 percent or more)	7					
35482 06	Nonferrous	8					
	Coiled and spooled continuous wire electrodes for automatic arc welding and inert gas shielded arc welding (including electrodes for submerged arc welding, base wire):						
	Hard facing:						
35482 07	Flux-cored and solid wire, self shielded and gas shielded, 7/64 in. or less	7	(S)	48.3	(NA)	(²⁰)	(²⁰)
35482 08	Flux-cored and solid wire, submerged arc welding (saw), 1/8 in. or more	3					
	Other than hard facing:						
	Solid wire:						
35482 11	Mild steel	6	214.6	102.5	6	107.3	67.2
35482 12	Low alloy steel	5					
35482 13	Stainless steel (chromium, 4 percent or more)	6					
35482 14	Nonferrous	3					
	Cored wire:						
35482 15	Mild steel	7	82.3	63.8	11	²⁰ 109.7	²⁰ 95.8
35482 16	Low alloy	5					
35482 00	Arc welding electrodes, metal, n.s.k.	(NA)	(X)	11.9	(NA)	(X)	14.8
35483 --	Resistance welders, components, accessories, and electrodes	(NA)	(X)	303.6	(NA)	(X)	187.8
	Resistance welders:						
35483 05	Spot and projection welders, single electrode	14	(S)	23.1	21	(S)	24.3
35483 06	Spot and projection welders, multielectrode	21	(S)	123.0	17	**1.1	74.8
35483 07	Seam welders	10	(S)	22.6	8	.2	11.7
35483 08	Other resistance welders, including flash, upset, and butt welders	11	(S)	13.1	13	(S)	39.2
35483 09	Resistance welder transformers (sold separately)	5	(S)	16.2	6	*8.3	7.5
35483 11	Resistance welder electrodes	4	(S)	13.4	17	(NA)	20.6
35483 19	Resistance welder components and accessories, including electrode holders, etc.	21	(X)	55.1			
35483 00	Resistance welders, components, accessories, and electrodes, n.s.k.	(NA)	(X)	37.0	(NA)	(X)	9.6
35484 --	Gas welding and cutting equipment, except plasma (including parts, attachments, and accessories)	(NA)	(X)	205.3	(NA)	(X)	226.6
35484 01	Torches, welding or cutting	12	(S)	37.7	15	(S)	67.4
35484 02	Cutting machines and carriages, stationary and portable	8	**2.8	38.4	9	(S)	28.5
35484 03	Other gas welding and cutting equipment, excluding pressure containers	10	(X)	31.9	5	(X)	19.0
	Spare parts, accessories, attachments, adaptors, etc., n.e.c., sold separately:						
35484 04	Tips	9	(X)	24.3	13	(X)	35.9
35484 05	Regulators, gas pressure	9	(S)	34.8	11	(S)	31.7
35484 09	All other	16	(X)	26.2	14	(X)	41.1
35484 00	Gas welding and cutting equipment, except plasma (including parts, attachments, and accessories), n.s.k.	(NA)	(X)	12.1	(NA)	(X)	2.9

See footnotes at end of table.

Table 6a-1. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For comparability of product classes and product codes between 1982 and 1987, see appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3548- --	WELDING APPARATUS—Con.						
35485 --	Other welding equipment, components, and accessories (excluding arc, resistance, and gas)-----	(NA)	(X)	²¹ 182.6	(NA)	(X)	²¹ 148.4
35485 01	Stud welding equipment----- number--	2	(S)	14.7	5	(S)	14.7
35485 03	Friction welding equipment----- do--	1	(S)	21.3	5	(S)	12.2
35485 04	Plasma welding and cutting equipment----- do--	13	(S)	93.9	9	(S)	34.1
35485 05	All other welding equipment-----	12	(X)	²² 14.9	12	(X)	²² 11.9
35485 07	Soldering equipment (except hand and ultrasonic)----- thousands--	6	(S)	23.4	7	(S)	17.3
35485 09	Components and accessories for all other welding equipment, excluding arc welders, resistance welders, and gas welding and cutting equipment-----	9	(X)	21.3	13	(X)	58.2
35485 00	Other welding equipment, components, and accessories (excluding arc, resistance, and gas), n.s.k.-----	(NA)	(X)	7.7	(NA)	(X)	--
35480 --	Welding apparatus, n.s.k.-----	(NA)	(X)	122.1	(NA)	(X)	²³ 62.7
35480 00	Welding apparatus, n.s.k., typically for establishments with 20 employees or more (see note)-----	(NA)	(X)	74.6	(NA)	(X)	²³ 43.7
35480 02	Welding apparatus, n.s.k., typically for establishments with less than 20 employees (see note)-----	(NA)	(X)	47.5	(NA)	(X)	²³ 19.0
3549- --	METALWORKING MACHINERY, N.E.C.						
	Total-----	(NA)	(X)	1 026.1	(NA)	(X)	780.2
35492 --	Assembly machines-----	(NA)	(X)	527.3	(NA)	(X)	367.6
35492 11	Rotary transfer (dial or rotary, trunnion, center column)----- number--	31	(S)	54.0	23	(S)	29.2
35492 15	In-line transfer, synchronous----- do--	26	(S)	37.6	19	(S)	53.9
35492 17	In-line transfer, nonsynchronous----- do--	21	(S)	103.9	13	**119	119.7
35492 13	Special purpose and other types----- do--	72	(S)	275.5			
35492 18	Parts and attachments for assembly machines (sold separately)-----	18	(X)	15.7	48	(S)	140.8
35492 00	Assembly machines, n.s.k.-----	(NA)	(X)	40.7	(NA)	(X)	24.0
35495 --	Metalworking machinery (except handheld and ultrasonic), n.e.c.-----	(NA)	(X)	336.9	(NA)	(X)	313.0
	Machines for weaving and other wire fabricating and wiredrawing machines and draw benches:-----						
35495 01	Draw benches and wiredrawing machines (except dies)-----	7	(X)	18.1			
35495 02	Wire rope or wire cable making machines-----	6	(X)	15.3	38	(X)	86.3
35495 03	Other machines for working wire-----	12	(X)	55.6			
	Coil handling equipment (conversion or straightening):-----						
35495 43	Cut-to-length lines-----	12	(X)	56.9	18	(X)	63.4
35495 45	Slitting lines-----	6	(X)	20.8	9	(X)	26.7
35495 92	Other metalworking machinery-----	48	(X)	124.6			
35495 95	Parts and attachments for other metalworking machinery (sold separately)-----	15	(X)	23.1	63	(X)	117.2
35495 00	Metalworking machinery (except handheld and ultrasonic), n.e.c., n.s.k.-----	(NA)	(X)	22.5	(NA)	(X)	19.4
35490 --	Metalworking machinery, n.e.c., n.s.k.-----	(NA)	(X)	161.8	(NA)	(X)	²³ 99.6
35490 00	Metalworking machinery, n.e.c., n.s.k., typically for establishments with 10 employees or more (see note)-----	(NA)	(X)	137.4	(NA)	(X)	²³ 79.8
35490 02	Metalworking machinery, n.e.c., n.s.k., typically for establishments with less than 10 employees (see note)-----	(NA)	(X)	24.4	(NA)	(X)	²³ 19.8

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoffs used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

¹Data reported by all producers, not just those with shipments of \$100,000 or more.

²For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

³For 1987, data for product code 35419 21 are combined with product code 35419 26 to avoid disclosing data for individual companies.

⁴For 1987, data for product code 35424 03 are combined with product code 35424 05 to avoid disclosing data for individual companies.

⁵For 1982, data for product codes 35441 42 and 35441 44 were not published separately but were included with product code 35441 48.

⁶For 1987, data for product codes 35442 17 and 35442 18 are combined to avoid disclosing data for individual companies.

⁷For 1982, data for product codes 35442 17, 35442 18, 35442 19, 35442 23, 35442 47, and 35442 67 were not collected separately but were included with product code 35442 45.

⁸Single point tools are one-piece single point of multiple point tool bits with integral cutting edges or with cutting tips brazed or bonded to holder or shank; with square, rectangular, round, and other cross-section shanks; and with single and double end, including flat form and dovetail tools used for turning, planing, boring, shaping, shaving, forming, threading, cutting off, etc.; excluding circular form tools, and all mechanical holding devices and replaceable inserts.

⁹Blanks are cast or formed material, unground, and requiring further processing to make a solid tool or cutting tip. (Does not include components pressed to size, as molded ready-to-use inserts.) Tips are finished or semifinished form of blank to be brazed, soldered, or otherwise bonded to a shank to form a cutting tool. Inserts are replaceable, mechanically-held-cutting-edge components of cutting tools, either pressed to size, or ground on all surfaces (precision ground), or ground on top and bottom only (utility ground).

¹⁰For 1982, data for product code 35455 96 were not published separately but were included with product codes 35455 93, 35455 81, 35455 83, 35455 97, and 35455 98.

¹¹For 1987, data for product codes 35455 81 and 35455 83 are combined to avoid disclosing data for individual companies.

¹²For 1987, data for product codes 35461 23 and 35461 25 are combined with product code 35461 35 to avoid disclosing data for individual companies.

¹³For 1982, data for product codes 35461 12 and 35461 37 were combined with product code 35461 35 to avoid disclosing data for individual companies.

¹⁴For 1987, data for product code 35462 61 are combined with product code 35462 71 to avoid disclosing data for individual companies.

¹⁵For 1987, data for product code 35463 11 are combined with product code 35463 12 to avoid disclosing data for individual companies.

¹⁶For 1982, data for product code 35471 11 were combined with product code 35471 17 to avoid disclosing data for individual companies.

¹⁷For 1987, data for product code 35473 47 are combined with product code 35473 48 to avoid disclosing data for individual companies.

¹⁸For 1987, data for product codes 35481 02 and 35481 03 are combined with product code 35481 06 to avoid disclosing data for individual companies.

¹⁹For 1982, data for product codes 35482 01 and 35482 02 were combined with product code 35482 06 to avoid disclosing data for individual companies.

²⁰For 1982, data for product code 35482 12 were combined with product codes 35482 15 and 35482 16 to avoid disclosing data for individual companies. For 1982, data for product codes 35482 07 and 35482 08 were not collected separately but were included with product codes 35482 15 and 35482 16.

²¹For 1987, electron beam welding equipment was reclassified to become part of product code 36997 00, Electronic Systems and Equipment, N.E.C. Data for electron beam welding equipment and induction welding equipment were published combined in 1982. Since these combined data were removed from the 1982 total, that total is not directly comparable to the 1987 total.

²²For 1987, data for induction welding equipment are included in product code 35485 05. For 1982, they are not included. For explanation, see footnote 21.

²³For 1982, data for product codes 35480 00 and 35480 02 included only electric welding apparatus. For 1982, data for product codes 35490 00 and 35490 02 included nonelectric welding equipment.

Table 6a-2. **Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982**

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MQ35W, METALWORKING MACHINERY				
	Metal cutting type machine tools:				
3541D --	Boring and drilling machines -----units--	7 708	154.7	(NA)	261.1
3541D 10	All boring machines valued less than \$2,500 each -----do--	--	--	(D)	(D)
	Boring machines valued at \$2,500 each or more:				
3541D 20	Horizontal boring, drilling, and milling machines, table type -----units--	29	18.8	77	51.4
3541D 30	Horizontal boring, drilling, and milling machines, floor type -----do--				
3541D 40	Precision boring machines, including horizontal and vertical boring machines -----do--	474	84.3	564	109.7
3541D 50	Jig boring machines, horizontal and vertical -----do--	15	3.8	(D)	(D)
3541D 60	All other boring machines, except boring lathes -----do--	--	--	(D)	(D)
3541D 05	All drilling machines valued less than \$2,500 each -----do--	5 865	29.5	15 491	12.0
	Drilling machines valued at \$2,500 each or more:				
3541D 15	Vertical upright drilling machines, including plain upright and heavy duty -----units--	423	3.2	1546	6.7
3541D 25	Radial drilling machines, including plain and universal -----do--	123	9.7	163	5.3
3541D 35	Deep hole drilling machines -----do--			110	10.4
	Multiple spindle drilling machines:				
3541D 45	Adjustable joint and fixed center types -----units--	650	18.7	2386	10.7
3541D 55	All other automatic multiple spindle drilling machines -----do--	129	6.7	272	15.6
3541D 65	All other drilling machines, n.e.c. -----do--			78	5.2
35413 --	Gear cutting machines -----units--	204	59.6	445	86.5
35413 12	Gear hobbers, horizontal and vertical -----do--	204	59.6	445	86.5
35413 31	Gear shapers, external spur and helical -----do--				
35413 71	Gear tooth finishing machines -----do--				
35413 54	Bevel gear generators -----do--				
35413 99	All other gear cutting machines -----do--	--	--	--	--
35414 --	Grinding, polishing, buffing, honing, and lapping machines -----units--	59 897	384.7	58 362	486.7
35414 10	All grinding, polishing, buffing, honing, and lapping machines valued less than \$2,500 each -----do--	52 683	13.1	48 651	13.2
	All grinding, polishing, buffing, honing, and lapping machines valued at \$2,500 each or more:				
	External cylindrical grinding machines:				
35414 11	Plain, including angular wheel types -----units--	78	20.1	394	68.9
35414 13	Universal -----do--	2103	6.6	302	23.7
35414 15	Roll grinders -----do--	575	76.1	637	93.6
35414 16	Centerless grinders, including shoe type -----do--				
35414 17	Chucking grinders -----do--				
35414 19	All other external cylindrical grinding machines -----do--				
35414 23	Internal cylindrical grinding machines, including centerless plain chucking type -----do--	(D)	(D)	(D)	(D)
35414 33	Surface grinding machines, rotary table type, horizontal and vertical -----do--	71	16.6	152	21.4
35414 34	Surface grinding machines, reciprocating table type, including face grinders, horizontal and vertical -----do--	421	13.3	1 270	35.4
35414 37	Surface grinding machines, reciprocating table type, including face grinders, hand surface type -----do--	878	8.9	1 310	11.2
35414 39	All other surface grinding machines, including planer type -----do--	(D)	(D)	(D)	(D)
35414 44	Disk grinders, double spindle -----do--	(D)	(D)	(D)	(D)
35414 46	All other disk grinders, bench, floor, snag grinders, and abrasive belt grinders -----do--	320	12.1	469	3.5
35414 52	Tool and cutter grinding machines -----do--	782	43.5	1 568	31.1
35414 92	All other grinding machines, n.e.c., including thread grinding machines -----do--	980	28.7	1 080	42.2
35414 75	Honing and lapping machines, internal, including combination bore, hone, and external -----do--	1 129	39.6	1 002	23.0
35414 79	Flat surface lapping machines, except gear lapping -----do--	187	8.6	165	4.3
35414 83	All other honing and lapping machines -----do--	(D)	(D)	(D)	(D)
35414 65	Polishing stands, abrasive belt drum and disk -----do--	333	6.0	(D)	(D)
35414 69	All other polishing and buffing machines, including speed lathes and multistation type -----do--	1 061	24.0	650	24.4
35415 --	Lathes -----units--	3 045	283.5	4 508	507.3
	Horizontal NC turning machines:				
	All lathes (turning machines) valued at \$2,500 each or more:				
35415 15	Multiple spindle numerically controlled turning machine -----units--	--	--	1 295	238.6
	Single spindle numerically controlled turning machines:				
35415 16	Small -----units--	1 352	120.0		
35415 17	Medium -----do--	96	24.1		
35415 18	Large -----do--	82	38.9		
	Vertical numerically controlled turning machines:				
	All lathes (turning machines) valued at \$2,500 each or more:				
	Numerically controlled turning machines, vertical spindle:				
35415 21	Vertical turret lathes and vertical boring machines more than 30 inch diameter table -----units--	96	42.6	194	94.8
35415 31	Vertical multiple spindle turning machines -----do--				
35415 33	All other vertical spindle turning machines -----do--				
35415 09	Nonnumerically controlled turning machines:				
	All lathes (turning machines) valued less than \$2,500 each -----units--	(D)	(D)	247	.5
	All lathes (turning machines) valued at \$2,500 each or more:				
	Horizontal spindle:				
	Engine or toolroom lathes, swing over cross slide:				
35415 14	Up to and including 8 inches -----units--	592	12.0	1 531	41.0
35415 22	More than 8 inches to 16 inches -----do--				
35415 36	More than 16 inches -----do--				
35415 37	All other engine or toolroom lathes -----do--				

Table 6a-2. Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MQ35W, METALWORKING MACHINERY—Con.				
	Metal cutting type machine tools—Con.				
	Lathes—Con.				
	Nonnumerically controlled turning machines—Con.				
	All lathes (turning machines) valued at \$2,500 each or more—Con.				
	Horizontal spindle—Con.				
	Automatic lathes:				
35415 83	Single spindle	(D)	(D)	(NA)	(NA)
	Multiple spindle:				
35415 88	Bar (screw) machines	(D)	(D)	293	40.7
35415 67	Chucking machines	(D)	(D)	54	14.1
35415 57	All other horizontal turning machines (including turret lathes and automatic between center lathes)	311	17.4	(D)	(D)
	Vertical spindle:				
35415 85	Vertical turret lathes and vertical boring machines (VTL and VBM)	(D)	(D)	(D)	(D)
35415 97	All other vertical turning machines, excluding vertical turret lathes and vertical boring machines (VTL and VBM)	(D)	(D)	(D)	(D)
35416 --	Milling machines	6 277	206.9	7 737	265.6
35416 09	All milling machines valued less than \$2,500 each	(D)	(D)	921	.6
	All milling machines valued at \$2,500 or more:				
	General purpose, knee or bed:				
35416 22	Horizontal plain, universal, and ram	(D)	(D)	5850	64.4
35416 25	Vertical, except ram	(D)	(D)		
35416 27	Vertical ram	(D)	(D)		
35416 29	All other general purpose type milling machines	(D)	(D)		
	Automatic and manufacturing, knee or bed:				
35416 31	Single spindle	(D)	(D)	228	21.9
35416 35	Multiple spindle and special purpose machines	437	19.6	429	22.9
35416 53	Profile machines and duplicators	175	132.2	309	155.7
35416 63	Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers				
35416 97	All other milling machines, n.e.c.				
3541A --	Machining centers	1 361	217.9	1 396	357.6
	Drill, mill, and bore (manual tool change):				
3541A 01	Vertical	(D)	(D)	249	33.2
3541A 03	Horizontal	(D)	(D)		
	Drill, mill, and bore, vertical (automatic tool change):				
3541A 05	Y-axis travel less than 20 inches	272	22.7	(D)	(D)
3541A 07	Y-axis travel 20 inches through 26 inches	329	37.2	309	48.1
3541A 09	Y-axis travel more than 26 inches	95	18.5	193	39.8
	Drill, mill, and bore, horizontal (automatic tool change):				
3541A 11	Y-axis travel less than 27 inches	(D)	(D)	237	72.3
3541A 13	Y-axis travel 27 inches through 40 inches	(D)	(D)	166	66.4
3541A 15	Y-axis travel more than 40 inches	84	57.9	107	79.7
3541A 17	Machining center with automatic multiple spindle head changing capability	(D)	(D)	-	-
3541A 19	All other machining centers	(D)	(D)	(D)	(D)
3541B --	Station type machines	434	299.6	792	731.1
3541B 31	Dial or rotary, trunnion, and center column	287	125.3	270	48.0
3541B 33	Way type			54	57.8
3541B 35	Transfer			346	540.4
3541B 37	Other station type, n.e.c.			122	84.9
3541C --	Other metal cutting machine tools	13 785	173.9	39 154	246.2
3541C 41	Other metal cutting machine tools, n.e.c., valued less than \$2,500	28 020	28.5	29 990	14.8
	Other metal cutting machine tools, n.e.c. valued at \$2,500 each or more:				
3541C 51	Broaching machines	94	11.1	166	38.3
	Sawing and cutoff machines:				
3541C 53	Power hack saws	104	1.3	3562	33.4
3541C 55	Circular cutoff saws (cold)	(D)	(D)	100	5.1
3541C 57	Abrasive wheel saws	(D)	(D)	322	3.5
3541C 59	Band saws	2 904	26.1	24 066	249.6
3541C 61	All other sawing and cutoff machines	558	15.3	1 228	37.1
3541C 63	Tapping machines	(D)	(D)	3373	27.7
	Spark erosion, ultrasonic, and electrolytic machines:				
3541C 65	Electric discharge machine (EDM) other than traveling wire	660	24.8	1113	35.8
3541C 67	Traveling wire EDM				
3541C 69	Electrochemical machines				
3541C 71	All other spark erosion, ultrasonic, and electrolytic machines				
3541C 91	Miscellaneous metal cutting machine tools	758	25.1	1 234	51.0
	Metal forming type machine tools:				
35421 --	Punching, shearing, bending, and forming machines	25 274	315.3	29 738	308.7
35421 08	All punching and shearing machines valued less than \$2,500 each	3 287	4.3	5 996	5.8
	All punching and shearing machines valued at \$2,500 each or more:				
	Power operated only:				
35421 11	Punches, including combination punching and shearing machines	1 684	16.8	1 870	21.4
35421 16	Punching machines fixed position and two axis positioning table	394	61.7	407	45.7
	Plate shearing machines:				
35421 12	Mechanical	2344	131.4	580	38.1
35421 14	Hydraulic	771	13.9	362	17.1
35421 15	Bar, angle, and rotary shearing machines	118	2.5	152	1.8
35421 19	Other power operated punching and shearing machines	207	11.4	365	12.3
35421 33	All bending and forming machines, power operated, valued less than \$2,500 each	11 534	10.8	214 016	210.0

Table 6a-2. **Related Products From Current Industrial Reports Series—Value of Shipments by All Producers: 1987 and 1982—Con.**

[Additional detail is provided in the Current Industrial Report series. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987 product shipments		1982 product shipments	
		Quantity	Value (million dollars)	Quantity	Value (million dollars)
	MQ35W, METALWORKING MACHINERY—Con.				
35421 —	Metal forming type machine tools—Con. Punching, shearing, bending, and forming machines—Con. All bending and forming machines, power operated, valued at \$2,500 each or more:				
	Press brakes:				
35421 39	Mechanical	74	13.3	415	7.7
35421 40	Hydraulic	1 657	130.9	612	28.0
35421 41	Hydromechanical	1 134	13.9	262	5.8
35421 37	Bending rolls, sheet, and plate	360	6.5	262	13.9
35421 35	Bending rolls, angles, bars, shapes, and tubes	(D)	(D)	116	13.3
35421 43	Rotary bending and forming machines, including rotary head	2 229	26.1	1 051	24.4
35421 47	Ram and press bending machines	(D)	(D)	819	11.4
35421 49	Other bending and forming machines, including folders	2 984	67.6	2 453	52.1
35422 —	Presses, except forgings and die stamping	8 134	265.6	11 765	344.8
35422 01	All presses valued less than \$2,500 each	5 585	4.0	8 618	6.5
	All presses valued at \$2,500 each or more:				
	Mechanical presses:				
	Open back inclinable, gap type:				
35422 12	50 tons or less	423	4.7	433	9.6
35422 02	51 tons to 120 tons	151	7.3	255	11.0
35422 03	121 tons or more	59	2.8	(D)	(D)
	Vertical straight sided and arch frame single action:				
35422 16	Single point	(D)	(D)	(D)	(D)
	Two point:				
35422 17	300 tons or less	61	15.0	137	43.1
35422 18	301 tons or more	67	37.3		
35422 42	Gap and horn type	36	4.0	162	4.5
35422 45	Automatic presses, strip or coil feed	331	52.0	327	47.6
35422 53	All other mechanical presses	62	76.7	296	103.3
	Hydraulic presses:				
	Vertical single action, all tonnages:				
35422 56	Housing or straight side type	14	4.3	82	30.0
35422 57	Column type (open rod)	113	10.8	268	7.3
	Gap or C-frame:				
35422 58	15 tons or less	472	3.7	450	9.3
35422 59	16 tons to 35 tons	(D)	(D)		
35422 60	More than 35 tons	(D)	(D)	99	4.8
35422 73	Vertical double action 2-slide type, all tonnages	(D)	(D)		
35422 77	Extrusion presses, all types	(D)	(D)		
35422 92	Other hydraulic and pneumatic presses, including horizontal	594	24.0	569	53.8
35423 —	All other metal forming type machine tools	15 001	306.9	6 701	210.0
35423 97	All other metal forming type machine tools valued less than \$2,500 each	10 424	5.6	1 493	2.4
	All other metal forming type machine tools valued at \$2,500 each or more:				
	Forging machines:				
35423 27	Headers and upsetters				
35423 31	Swaging machines				
35423 32	Forging presses (die stamping presses)	184	42.7	383	79.0
35423 37	All other forging machines				
35423 43	Thread rolling machinery	3 297	39.7	111	7.2
35423 30	Metal container-making machinery	1 300	140.0	1 349	44.0
	Die casting machines:				
35423 51	200 tons or less				
35423 52	201 tons to 500 tons				
35423 53	501 tons to 700 tons	180	49.5	106	16.7
35423 54	701 tons or more				
35423 49	Riveting machines	1 096	15.3	1 320	14.6
35423 91	All other metal forming type machine tools	1 520	44.1	1 939	46.1

Note: The percent of estimation of each item is indicated as follows (see "Description of Survey" for a discussion of estimation of missing reports): *16 to 25 percent of this item is estimated. **26 to 50 percent of this item is estimated. ***More than 50 percent of this item is estimated.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982

(Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
3541D, BORING MACHINES AND DRILLING MACHINES			35421, PUNCHING, SHEARING, BENDING, AND FORMING MACHINES		
United States	157.0	266.0	United States	334.4	317.3
Connecticut.....	21.7	(NA)	California.....	51.0	23.9
Illinois.....	19.3	19.1	Connecticut.....	5.0	2.6
Indiana.....	5.9	(NA)	Illinois.....	73.6	70.0
Michigan.....	76.2	99.1	Michigan.....	27.2	22.4
Ohio.....	4.9	(NA)	Minnesota.....	4.5	(NA)
Wisconsin.....	15.3	(NA)	Ohio.....	62.9	57.6
			Wisconsin.....	5.2	5.3
35414, GRINDING, POLISHING, BUFFING, HONING, AND LAPPING MACHINES			35422, PRESSES, EXCEPT FORGING AND DIE-STAMPING		
United States	396.1	515.3	United States	268.9	369.2
Illinois.....	43.8	53.4	Illinois.....	84.0	131.7
Michigan.....	70.0	48.2	Indiana.....	4.2	7.9
Minnesota.....	11.2	12.4	Michigan.....	37.2	32.6
New York.....	8.2	10.5	Ohio.....	58.1	101.4
Ohio.....	44.6	(NA)	Pennsylvania.....	21.9	20.8
Pennsylvania.....	42.0	(NA)			
35415, LATHES			35423, OTHER METAL FORMING MACHINE TOOLS, N.E.C.		
United States	266.5	523.6	United States	307.0	217.0
Connecticut.....	3.5	68.5	Illinois.....	46.3	17.1
Michigan.....	20.2	11.4	Indiana.....	8.7	(NA)
Ohio.....	106.2	282.4	Michigan.....	56.4	19.9
			Ohio.....	125.8	87.7
35416, MILLING MACHINES			35424, PARTS FOR METAL FORMING MACHINE TOOLS		
United States	197.2	264.5	United States	392.9	380.0
Michigan.....	11.9	8.0	California.....	14.8	21.3
Wisconsin.....	7.6	(NA)	Connecticut.....	12.4	17.7
			Illinois.....	80.6	93.1
35418, MACHINE TOOLS HOME WORKSHOPS			Indiana.....	7.5	6.3
United States	97.2	85.7	Massachusetts.....	7.5	5.7
Illinois.....	12.2	10.2	Michigan.....	58.6	52.9
Massachusetts.....	3.0	(NA)	New Jersey.....	13.3	5.7
Michigan.....	4.8	5.4	New York.....	26.0	12.3
Minnesota.....	12.4	(NA)	Ohio.....	102.4	58.4
			Pennsylvania.....	17.8	27.6
35419, PARTS FOR METAL CUTTING TYPE MACHINE TOOLS			35441, SPECIAL DIES AND TOOLS, DIE SETS, JIGS, AND FIXTURES		
United States	577.5	891.9	United States	4 219.7	3 425.9
California.....	6.1	22.5	Alabama.....	23.8	13.9
Connecticut.....	37.9	60.1	Arizona.....	14.6	8.8
Illinois.....	44.6	85.9	Arkansas.....	12.8	6.0
Indiana.....	17.2	16.7	California.....	247.0	173.2
Massachusetts.....	20.3	26.2	Colorado.....	13.6	11.7
Michigan.....	88.1	165.1	Connecticut.....	82.3	69.9
Minnesota.....	7.4	20.6	Florida.....	19.5	26.5
New York.....	60.4	66.9	Georgia.....	21.9	15.1
Ohio.....	138.4	210.8	Illinois.....	280.3	247.0
Pennsylvania.....	23.6	40.8	Indiana.....	190.8	148.9
Rhode Island.....	13.5	15.5	Iowa.....	26.6	16.4
South Carolina.....	6.2	(NA)	Kansas.....	5.2	3.8
Tennessee.....	2.2	(NA)	Kentucky.....	25.8	11.4
Vermont.....	15.8	23.6	Maine.....	7.1	4.9
Wisconsin.....	35.8	67.7	Maryland.....	10.0	9.7
3541A, MACHINING CENTERS			Massachusetts.....	57.5	54.1
United States	231.7	365.7	Michigan.....	1 541.7	1 248.7
New York.....	19.4	(NA)	Minnesota.....	64.9	45.6
3541B, STATION TYPE MACHINES			Mississippi.....	8.1	7.0
United States	316.4	735.4	Missouri.....	57.6	52.2
Michigan.....	183.8	525.2	Nebraska.....	3.8	3.0
Ohio.....	3.9	(NA)	New Hampshire.....	2.8	3.8
			New Jersey.....	56.7	67.2
3541C, METAL CUTTING MACHINE TOOLS, N.E.C.			New York.....	158.1	197.7
United States	189.1	250.6	North Carolina.....	19.1	19.3
California.....	13.0	4.0	Ohio.....	650.3	507.7
Connecticut.....	5.6	3.4	Oklahoma.....	4.3	(NA)
Illinois.....	23.6	44.0	Oregon.....	2.5	2.4
Michigan.....	45.4	66.9	Pennsylvania.....	331.9	253.5
New Jersey.....	14.0	(NA)	Rhode Island.....	10.4	(NA)
Ohio.....	34.3	58.8	South Carolina.....	10.7	8.7
Pennsylvania.....	4.2	12.2	Tennessee.....	58.4	31.4
Wisconsin.....	14.7	6.7	Texas.....	26.6	30.8
			Virginia.....	4.5	8.2
			Washington.....	3.7	2.4
			Wisconsin.....	153.1	95.4

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
35442, INDUSTRIAL MOLDS AND MOLD BOXES			35455, PRECISION MEASURING TOOLS		
United States	2 523.2	1 800.6	United States	440.9	402.7
Alabama	19.0	5.9	California	11.9	15.2
Arizona	14.1	11.0	Connecticut	16.7	16.9
Arkansas	5.0	3.8	Illinois	11.3	5.6
California	213.8	145.9	Indiana	5.8	6.4
Colorado	12.3	5.6	Michigan	98.2	101.1
Connecticut	53.2	41.1	New York	68.9	32.0
Florida	35.8	25.0	Ohio	74.2	63.8
Georgia	16.5	5.5			
Illinois	290.3	232.1	35461, POWER-DRIVEN HANDTOOLS, ELECTRIC (INCLUDING BATTERY-POWERED)		
Indiana	121.0	94.3	United States	1 061.9	829.9
Iowa	7.0	6.8	Illinois	21.3	78.7
Kansas	6.9	.5			
Kentucky	9.9	7.6	35462, POWER-DRIVEN HANDTOOLS, PNEUMATIC, HYDRAULIC, AND POWDER-ACTUATED		
Maine	2.9	3.1	United States	508.5	382.4
Massachusetts	73.9	76.5	California	22.0	17.6
Michigan	514.2	314.6	New York	63.3	(NA)
Minnesota	79.7	46.6	Ohio	125.1	70.0
Mississippi	2.1	(NA)			
Missouri	56.1	35.8	35472, COLD ROLLING MILL MACHINERY		
Nebraska	2.3	(NA)	United States	67.2	65.1
New Hampshire	10.3	11.0	Connecticut	15.4	(NA)
New Jersey	125.7	110.2	Ohio	7.7	(NA)
New York	65.1	70.7			
North Carolina	22.3	16.8	35473, ROLLING MILL MACHINERY, N.E.C., AND PARTS		
Ohio	343.2	246.5	United States	137.3	188.2
Oregon	6.9	4.5	Illinois	9.6	12.2
Pennsylvania	188.2	147.3	Ohio	65.8	48.3
Rhode Island	5.4	4.8	Pennsylvania	15.9	58.3
South Carolina	10.9	6.6			
Tennessee	11.4	7.5	35481, ARC WELDING MACHINES, COMPONENTS, AND ACCESSORIES		
Texas	21.5	21.7	United States	609.9	511.6
Utah	2.2	(NA)	California	33.1	17.5
Vermont	3.5	(NA)	Illinois	33.5	28.4
Virginia	6.2	2.2	Michigan	102.4	31.6
Washington	12.4	5.7	Missouri	10.7	(NA)
Wisconsin	145.6	66.3	35482, ARC WELDING ELECTRODES, METAL		
35451, SMALL CUTTING TOOLS FOR MACHINE TOOLS AND METALWORKING MACHINERY			United States	494.4	469.6
United States	1 880.8	1 755.7	Ohio	291.7	233.5
Alabama	27.0	27.0			
Arizona	4.9	(NA)	35483, RESISTANCE WELDERS, COMPONENTS, ACCESSORIES, AND ELECTRODES		
California	61.8	57.5	United States	303.6	187.8
Connecticut	46.2	45.1	Illinois	16.8	10.2
Florida	18.3	15.9	Michigan	216.5	121.8
Georgia	36.9	35.9	New Jersey	9.6	4.9
Illinois	176.7	162.3	Ohio	29.6	14.1
Indiana	31.3	22.3			
Iowa	11.3	10.1	35484, GAS WELDING AND CUTTING EQUIPMENT		
Kentucky	9.3	6.9	United States	205.3	226.6
Massachusetts	87.1	141.0	California	5.5	8.8
Michigan	362.7	414.3	Pennsylvania	11.1	13.1
New Jersey	49.8	50.4			
New York	43.0	72.4	35485, OTHER WELDING EQUIPMENT, EXCEPT ULTRASONIC AND LASER		
North Carolina	74.6	39.3	United States	182.6	148.4
Ohio	304.1	255.7	California	4.8	(NA)
Pennsylvania	121.1	82.1	Illinois	14.6	(NA)
Rhode Island	15.6	19.1	Michigan	5.6	(NA)
South Carolina	125.6	73.1	Ohio	22.4	(NA)
Tennessee	56.5	(NA)			
Texas	18.8	15.8			
Vermont	49.3	41.7			
Wisconsin	81.5	49.2			
35454, MACHINE TOOL ATTACHMENTS AND ACCESSORIES, N.E.C.					
United States	542.6	593.6			
California	15.5	19.9			
Connecticut	50.3	58.1			
Illinois	26.9	49.9			
Indiana	11.7	16.3			
Massachusetts	16.9	8.1			
Michigan	110.4	148.5			
New Jersey	11.7	9.0			
New York	35.1	30.2			
Ohio	92.5	85.7			
Pennsylvania	12.5	36.2			
Rhode Island	8.1	(NA)			
Wisconsin	24.9	13.8			

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1987 and 1982—Con.

[Million dollars. Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by type" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1987. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

Product class and geographic area	1987 value of product shipments	1982 value of product shipments	Product class and geographic area	1987 value of product shipments	1982 value of product shipments
35492, ASSEMBLY MACHINES			35492, ASSEMBLY MACHINES—Con.		
United States -----	527.3	367.6	Pennsylvania -----	20.8	(NA)
California -----	4.8	2.7	35495, METALWORKING MACHINERY, N.E.C.		
Connecticut -----	36.0	12.2	United States -----	336.9	313.0
Illinois -----	43.8	22.7	California -----	19.1	(NA)
Indiana -----	25.0	16.1	Connecticut -----	3.0	(NA)
Massachusetts -----	10.1	(NA)	Illinois -----	52.5	(NA)
Michigan -----	228.3	168.9	Massachusetts -----	9.1	(NA)
Minnesota -----	14.6	5.2	Michigan -----	32.7	(NA)
New York -----	35.7	(NA)	New Jersey -----	23.3	(NA)
Ohio -----	40.1	24.6	New York -----	10.0	(NA)
			Ohio -----	31.8	(NA)

¹For 1982, data for product class 35485 excluded induction welding equipment.

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1987 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For comparability of product classes and product codes between 1982 and 1987 and explanation of terms, see appendixes]

1987 product code	Product class	1987	1986 ¹	1985 ¹	1984 ¹	1983 ¹	1982	1977	1972
3541-	Machine tools, metal cutting types -----	2 585.2	2 939.7	2 920.7	2 815.0	2 544.9	4 154.7	2 560.5	1 258.5
3541D	Boring machines and drilling machines -----	157.0	129.7	135.9	142.8	139.4	266.0	202.4	132.4
35413	Gear cutting machines -----	62.4	57.8	56.5	41.6	40.3	87.3	67.1	56.7
35414	Grinding, polishing, buffing, honing, and lapping machines -----	36.1	41.2	41.2	378.3	331.6	515.3	288.3	169.6
35415	Lathes -----	266.5	265.3	313.0	300.6	306.5	523.6	455.9	197.6
35416	Milling machines -----	197.2	154.0	185.5	184.6	145.4	264.5	167.8	86.6
35418	Machine tools home workshops -----	97.2	96.9	121.0	94.9	71.9	85.7	66.3	⁽²⁾ 303.1
35419	Parts for metal cutting type machine tools -----	577.5	740.1	732.4	794.6	694.6	891.9	502.1	242.1
3541A	Machining centers -----	231.7	227.8	230.9	215.3	184.5	365.7		⁽²⁾
3541B	Station type machines -----	316.4	516.1	388.3	330.3	271.9	735.4	647.3	⁽²⁾
3541C	Metal cutting machine tools, n.e.c. -----	189.1	137.9	158.7	162.2	181.4	250.6		⁽²⁾
35410	Machine tools, metal cutting types, n.s.k. -----	94.2	201.8	186.1	169.8	177.5	168.7	163.3	71.4
3542-	Machine tools, metal forming types -----	1 370.3	1 429.5	1 432.5	1 362.6	1 119.2	1 383.9	1 114.7	670.1
35421	Punching, shearing, bending, and forming machines -----	334.4	303.3	376.1	355.4	242.3	317.3	280.1	153.4
35422	Presses, except forging and die-stamping -----	268.9	306.6	281.5	247.7	176.5	369.2	282.6	183.2
35423	Other metal forming machine tools, n.e.c. -----	307.0	219.5	200.1	178.4	168.9	217.0	171.7	149.0
35424	Parts for metal forming machine tools -----	392.9	505.8	480.2	482.7	430.7	380.0	295.5	161.5
35420	Machine tools, metal forming types, n.s.k. -----	67.3	94.2	94.7	98.4	100.8	100.5	85.0	23.0
3543-	Industrial patterns -----	557.9	601.8	573.4	510.4	493.6	561.5	411.9	234.4
35430	Industrial patterns, except shoe patterns -----	557.9	601.8	573.4	510.4	493.6	561.5	411.9	234.4
3544-	Special dies, tools, jigs, and fixtures -----	8 142.8	8 567.8	8 143.8	7 561.4	6 113.3	6 099.3	4 450.2	2 713.5
35441	Special dies and tools, die sets, jigs, and fixtures -----	4 219.7	5 090.3	4 745.1	4 343.5	3 410.2	3 425.9	2 578.0	1 520.1
35442	Industrial molds and mold boxes -----	2 523.2	2 449.1	2 491.3	2 248.3	1 817.5	1 800.6	1 040.0	640.3
35440	Special dies, tools, jigs, and fixtures, n.s.k. -----	1 399.9	1 028.3	907.3	969.6	885.6	872.8	832.2	553.1
3545-	Machine tool accessories -----	3 417.8	3³ 464.4	3 506.0	3 376.8	2 652.4	3 069.1	2 238.9	1 151.4
35451	Small cutting tools for machine tools and metalworking machinery -----	1 880.8	2 053.8	2 030.8	1 982.0	1 485.3	1 755.7	1 376.4	738.0
35454	Machine tool attachments and accessories, n.e.c. -----	542.6	770.4	793.2	670.7	524.6	593.6	430.9	218.8
35455	Precision measuring tools -----	440.9	466.4	487.7	456.7	343.8	402.7	208.2	94.7
35450	Machine tool accessories, n.s.k. -----	553.6	173.9	194.3	267.4	298.7	317.0	223.5	99.9
3546-	Power-driven handtools -----	1 886.1	1 924.4	1 895.4	1 824.1	1 591.3	1 594.8	1 496.5	*725.0
35461	Power-driven handtools, electric (including battery-powered) -----	1 061.9	1 036.5	988.8	906.5	829.6	829.9	748.7	386.9
35462	Power-driven handtools, pneumatic, hydraulic, and powder-actuated -----	508.5	544.3	524.4	485.3	389.6	382.4	371.1	320.0
35463	Power-driven handtools, engine (internal combustion) driven -----	213.7	269.7	300.1	350.1	318.2	326.5	347.1	
35460	Power-driven handtools, n.s.k. -----	101.9	73.9	82.1	82.1	54.0	56.0	29.6	18.1
3547-	Rolling mill machinery -----	403.0	263.9	351.5	273.0	339.9	445.1	361.0	247.9
35471	Hot rolling mill machinery (except tube rolling) -----	175.3	95.5	144.2	84.7	147.1	180.5	147.0	134.7
35472	Cold rolling mill machinery -----	67.2	54.2	66.9	65.4	73.4	65.1	74.9	52.4
35473	Rolling mill machinery, n.e.c., and parts -----	137.3	102.8	131.2	109.7	107.0	188.2	120.8	55.6
35470	Rolling mill machinery, n.s.k. -----	23.2	11.3	9.2	13.3	12.4	11.4	18.3	5.2
3548-	Welding apparatus -----	1 918.0	(NA)	(NA)	(NA)	(NA)	1 606.6	(NA)	(NA)
35481	Arc welding machines, components, and accessories -----	609.9	515.3	575.2	543.1	446.6	511.6	407.8	218.5
35482	Arc welding electrodes, metal -----	494.4	508.3	505.5	510.2	398.9	469.6	447.6	215.5
35483	Resistance welders, components, accessories, and electrodes -----	303.6	333.8	295.5	210.8	168.9	187.8	136.9	115.1
35484	Gas welding and cutting equipment -----	205.3	219.4	240.5	230.6	223.8	226.6	(NA)	(NA)
35485	Other welding equipment, except ultrasonic and laser -----	182.6	(NA)	(NA)	(NA)	(NA)	⁵ 148.4	(NA)	(NA)
35480	Welding apparatus, n.s.k. -----	122.1	(NA)	(NA)	(NA)	(NA)	62.7	(NA)	(NA)
3549-	Metalworking machinery, n.e.c. -----	1 026.1	(NA)	(NA)	(NA)	(NA)	780.2	(NA)	(NA)
35492	Assembly machines -----	527.3	530.9	465.5	397.0	242.7	367.6	128.4	(NA)
35495	Metalworking machinery, n.e.c. -----	336.9	(NA)	(NA)	(NA)	(NA)	313.0	(NA)	(NA)
35490	Metalworking machinery, n.e.c., n.s.k. -----	161.8	(NA)	(NA)	(NA)	(NA)	799.6	(NA)	(NA)

See footnotes at end of table.

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1987 and Earlier Years—Con.

¹Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.
²For 1972, data for product classes 3541A, 3541B, and 3541C were included with product class 3541B.
³For 1986 and prior years, data for product classes 35451, 35454, and 35455 were collected and published as product classes 35451, 35453, and 35452 respectively.
⁴Prior to 1977, chain saws and parts were classified in Industry 3553. For 1977 and later years, chain saws and parts are classified in Industry 3546. Before 1977, hydraulic and internal combustion engine driven handtools and parts (excluding chain saws and parts) were classified in Industry 3546, but not collected separately.
⁵For 1982, data for product class 35485 excluded induction welding equipment.
⁶For 1982, data for product class 35480 included only electric welding apparatus.
⁷For 1982, data for product class 35490 included nonelectric welding equipment.

Table 7. Materials Consumed by Kind: 1987 and 1982

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3541, MACHINE TOOLS, METAL CUTTING TYPES				
	Materials, parts, containers, and supplies	(X)	1 151.4	(X)	1 380.0
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons..	(S)	17.3	(S)	35.1
331012	Sheet and strip do..	(S)	8.9	(S)	9.2
331013	Plates do..	(S)	6.3	(S)	13.1
331015	Structural shapes do..	(S)	1.9	(S)	9.0
331017	Wire and wire products do..	(S)		(S)	
331019	All other carbon steel mill shapes and forms..... do..	(S)	11.7	(S)	3.2
	Alloy steel, except stainless:				
331021	Bars and bar shapes 1,000 s tons..	(S)	6.1	(S)	15.1
331029	All other alloy steel mill shapes and forms..... do..	(S)	2.8	(S)	3.7
331031	Stainless steel..... do..	(S)	.9	(S)	1.6
335004	Copper and copper-base alloy mil lb..	(S)	.3	(S)	2.0
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil mil lb..	(S)	1.8	(S)	1.8
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do..	(S)	1.3	(S)	1.0
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do..	(S)	.6	(S)	.6
335609	Nonferrous metal mill shapes and forms (except copper and aluminum)..... do..	(S)	.2	(S)	1.4
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content)..... do..	(S)	3.4	(S)	6.2
329101	Grinding wheels and other abrasive products, except industrial diamonds (X)	(X)	5.5	(X)	10.0
190023	Iron and steel scrap, excluding home scrap..... 1,000 s tons..	(S)	2.1	(S)	2.3
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) 1,000 s tons..	(S)	42.7	(S)	88.0
332045	Steel do..	(S)	12.6	(S)	54.6
336005	Aluminum and aluminum-base alloy mil lb..	(S)	2.9	(S)	3.0
336006	Copper and copper-base alloy do..	(S)	.5	(S)	1.2
336008	Other nonferrous do..	(S)	1.3	(D)	(²)
346200	Iron and steel forgings 1,000 s tons..	(S)	2.7	(S)	15.4
349271	Fluid power (hydraulic and pneumatic) valves (X)	(X)	10.3	(X)	11.3
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies (X)	(X)	3.4	(X)	5.9
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362110	Timing motors, synchronous and subsynchronous thousands..	(S)	22.6	(S)	21.7
362115	Other fractional horsepower electric motors (less than 1 hp) (excluding timing motors)..... do..	(S)	9.5	(S)	5.1
362120	Integral horsepower motors and generators (1 hp and larger) do..	(S)	24.5	(S)	35.1
	Bearings, including mounted and unmounted:				
356218	Ball (X)	(X)	12.8	(X)	17.6
356201	Roller (X)	(X)	4.1	(X)	8.3
356601	Speed changers, gears, and industrial high-speed drives (X)	(X)	3.7	(X)	17.4
	Pumps (complete assemblies):				
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions..... thousands..	(S)	7.3	(S)	10.6
356102	Other pumps do..	(S)	1.6	(S)	1.3
356301	Air and gas compressors do..	(S)	.5	(S)	1.1
356921	Filters for hydraulic fluid power systems (X)	(X)	2.1	(X)	2.1
359301	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators..... (X)	(X)	3.4	(X)	6.1
359302	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) (X)	(X)	4.0	(X)	13.9
360101	Electric transmission, distribution, and control equipment..... (X)	(X)	24.2	(X)	33.2
265001	Paperboard containers, boxes, and corrugated paperboard ... 1,000 s tons..	(S)	1.1	(S)	1.2
305201	Rubber and plastics hose and belting (X)	(X)	2.2	(X)	2.3
345001	Bolts, nuts, screws, washers, rivets, and screw machine products (X)	(X)	8.9	(X)	16.0
354501	Cutting tools for machine tools (X)	(X)	13.9	(X)	36.1
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings (X)	(X)	11.1	(X)	20.9
362520	Numerical controls for metalworking machinery (except programmable) (X)	(X)	35.6	(X)	34.2
362521	Programmable controllers for metalworking machinery (X)	(X)	28.7	(X)	83.4
970099	All other materials and components, parts, containers, and supplies (X)	(X)	395.3	(X)	³ 445.2
971000	Materials, parts, containers, and supplies, n.s.k. ² (X)	(X)	386.8	(X)	272.5

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3542, MACHINE TOOLS, METAL FORMING TYPES				
	Materials, parts, containers, and supplies -----	(X)	542.9	(X)	512.8
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons ..	(S)	11.3	(S)	18.9
331012	Sheet and strip ----- do ..	(S)	2.8	(S)	1.8
331013	Plates ----- do ..	(S)	21.0	**52.5	26.7
331015	Structural shapes ----- do ..	(S)	3.2	(S)	4.6
331017	Wire and wire products ----- do ..	*.3	.3	(S)	1.8
331019	All other carbon steel mill shapes and forms ..	(S)	4.5	(S)	4.2
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons ..	(S)	2.9	(S)	7.1
331029	All other alloy steel mill shapes and forms ..	(S)	2.6	(S)	.4
331031	Stainless steel ----- do ..	(S)	.7	(S)	.8
335004	Copper and copper-base alloy ----- mil lb ..	*.9	1.9	(S)	19.0
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb ..	(S)	2.5	(S)	.5
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do ..	(S)	1.5	(S)	(Z)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ..	(S)	.3		
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ..	(S)	.1	(D)	(³)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ..	(S)	2.0	(S)	1.2
329101	Grinding wheels and other abrasive products, except industrial diamonds ..	(X)	1.7	(X)	1.5
190023	Iron and steel scrap, excluding home scrap .. 1,000 s tons ..	(S)	.9	(S)	.3
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons ..	(S)	17.3	(S)	27.0
332045	Steel ----- do ..	(S)	6.7	(S)	16.6
336005	Aluminum and aluminum-base alloy ----- mil lb ..	(S)	.8	(S)	2.4
336006	Copper and copper-base alloy ----- do ..	(S)	1.8	(S)	2.9
336008	Other nonferrous ----- do ..	(S)	.2	(S)	.4
346200	Iron and steel forgings ----- 1,000 s tons ..	(S)	5.4	(S)	13.8
349271	Fluid power (hydraulic and pneumatic) valves ..	(X)	5.1	(X)	3.5
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies ..	(X)	4.3	(X)	.9
	Electric motors and generators:				
	Fractional horsepower electric motors (less than 1 hp):				
362110	Timing motors, synchronous and subsynchronous .. thousands ..	(S)	3.4	(S)	3.0
362115	Other fractional horsepower electric motors (less than 1 hp) (excluding timing motors) ..	(S)	.5	(S)	2.1
362120	Integral horsepower motors and generators (1 hp and larger) ..	(S)	9.1	(S)	6.7
	Bearings, including mounted and unmounted:				
356218	Ball ----- do ..	(X)	4.2	(X)	3.2
356201	Roller ----- do ..	(X)	4.7	(X)	6.3
356601	Speed changers, gears, and industrial high-speed drives ..	(X)	4.8	(X)	5.7
	Pumps (complete assemblies):				
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions .. thousands ..	(S)	7.9	(S)	6.6
356102	Other pumps ----- do ..	(S)	.9	(S)	.4
356301	Air and gas compressors ----- do ..	(S)	.5	(D)	(³)
356921	Filters for hydraulic fluid power systems ..	(X)	.2	(X)	.4
359301	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators ..	(X)	9.3	(X)	3.5
359302	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) ..	(X)	3.8	(X)	3.6
360101	Electric transmission, distribution, and control equipment ..	(X)	9.5	(X)	6.2
265001	Paperboard containers, boxes, and corrugated paperboard .. 1,000 s tons ..	(S)	.7	(S)	.7
305201	Rubber and plastics hose and belting ----- do ..	(X)	1.7	(X)	.5
345001	Bolts, nuts, screws, washers, rivets, and screw machine products ..	(X)	5.8	(X)	4.3
354501	Cutting tools for machine tools ----- do ..	(X)	6.1	(X)	4.0
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings ..	(X)	6.1	(X)	.9
362520	Numerical controls for metalworking machinery (except programmable) ..	(X)	1.7	(X)	1.9
362521	Programmable controllers for metalworking machinery ..	(X)	10.5	(X)	6.1
970099	All other materials and components, parts, containers, and supplies ..	(X)	106.1	(X)	³ 140.6
971000	Materials, parts, containers, and supplies, n.s.k. ² ..	(X)	243.6	(X)	149.8
	INDUSTRY 3543, INDUSTRIAL PATTERNS				
	Materials, parts, containers, and supplies -----	(X)	91.4	(X)	74.1
	Mill shapes and forms, except castings and forgings:				
	Carbon steel ----- 1,000 s tons ..	(S)	.7	(S)	1.7
331020	Alloy steel, except stainless ----- do ..	(S)	.4	*1.0	1.0
331031	Stainless steel ----- do ..	(S)	.2	**5.5	1.6
335105	Copper and copper-base alloy ----- mil lb ..	(Z)	.9		1.3
335001	Aluminum and aluminum-base alloy ----- do ..	(S)	1.1	**2.2	2.3
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons ..	(S)	4.8	(S)	5.0
332045	Steel ----- do ..	(S)	1.6	(S)	3.5
336005	Aluminum and aluminum-base alloy ----- mil lb ..	(S)	2.0	(S)	3.7
336006	Copper and copper-based alloy ----- do ..	(S)	.1	**1.0	1.3
336008	Other nonferrous ----- do ..	(S)	.1	2.2	1.1
242101	Rough and dressed lumber ----- 1,000 bd ft ..	(S)	1.5	**8.9	6.8

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3543, INDUSTRIAL PATTERNS—Con.				
308007	Plastics products consumed in the form of sheets, rods, tubes, and other shapes -----	(X)	.8	(X)	3.1
970099	All other materials and components, parts, containers, and supplies consumed -----	(X)	20.5	(X)	8.4
971000	Materials, parts, containers, supplies, n.s.k. ² -----	(X)	57.6	(X)	33.3
	INDUSTRY 3544, SPECIAL DIES, TOOLS, JIGS, AND FIXTURES				
	Materials, parts, containers, and supplies -----	(X)	1 638.1	(X)	1 131.6
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons--	(S)	75.4	(S)	52.3
331012	Sheet and strip ----- do--	(S)	31.7	(S)	17.0
331013	Plates ----- do--	(S)	42.1	(S)	48.1
331015	Structural shapes ----- do--	(S)	6.0	(S)	7.3
331017	Wire and wire products ----- do--	(S)	1.1	(S)	.4
331019	All other carbon steel mill shapes and forms----- do--	(S)	16.2	(S)	9.0
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons--	(S)	88.7	(S)	60.5
331029	All other alloy steel mill shapes and forms----- do--	(S)	39.1	(S)	18.6
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons--	(S)	6.3	(S)	5.0
331050	All other stainless steel mill shapes and forms ----- do--	(S)	17.7	(S)	7.4
	Copper and copper-base alloy:				
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- mil lb--	(S)	2.5	(S)	1.9
335143	Plate, sheet, and strip, including military cups and discs----- do--	(S)	6.3	(S)	4.8
335003	All other ----- do--	(S)	.3	(S)	4.8
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb--	(S)	13.8	(S)	7.7
335405	Extruded shapes, including rod, bar, pipe, tube, etc. ----- do--	(S)	5.7	(S)	3.4
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do--	(S)	2.4	(S)	1.1
335609	Nonferrous metal mill shapes and forms, except copper and aluminum -----	(X)	1.3	(X)	.9
329903	Industrial diamonds ----- carats--	(S)	4.6	(S)	3.0
	Metal powders:				
339916	Tungsten carbide ----- mil lb--	(S)	14.7	(S)	14.7
339919	All other ----- do--	**3	3.0	**5	3.3
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons--	(S)	15.0	**3.8	1.2
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons--	(S)	17.8	(S)	28.0
332045	Steel ----- do--	(S)	10.9	(S)	7.9
336005	Aluminum and aluminum-base alloy ----- mil lb--	(S)	5.8	(S)	4.9
336006	Copper and copper-base alloy ----- do--	(S)	7.8	(S)	4.0
336008	Other nonferrous ----- do--	(S)	28.0	(S)	2.7
346200	Iron and steel forgings ----- 1,000 s tons--	(S)	2.9	**1.4	2.4
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	1.8	(X)	.7
356201	Roller -----	(X)	.9	(X)	.4
359411	Hydraulic and pneumatic equipment, including pumps and compressors -----	(X)	8.6	(X)	4.7
360101	Electric transmission, distribution, and control equipment -----	(X)	17.2	(X)	2.9
329101	Grinding wheels and other abrasive products, except industrial diamonds -----	(X)	12.4	(X)	9.0
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	(X)	24.2	(X)	10.1
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses -----	(X)	1.3	(X)	(⁵)
320601	Ceramic and ceramic composite parts, components, and accessories -----	(X)	.5	(X)	(⁵)
970099	All other materials and components, parts, containers, and supplies -----	(X)	304.7	(X)	⁵ 206.2
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	799.4	(X)	579.3
	INDUSTRY 3545, MACHINE TOOL ACCESSORIES				
	Materials, parts, containers, and supplies -----	(X)	800.6	(X)	778.8
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons--	(S)	52.0	(S)	37.1
331012	Sheet and strip ----- do--	(S)	1.5	(S)	1.5
331013	Plates ----- do--	(S)	2.4	(S)	3.7
331015	Structural shapes ----- do--	(S)	1.3	(S)	1.5
331017	Wire and wire products ----- do--	(S)	4.3	(S)	4.7
331019	All other carbon steel mill shapes and forms----- do--	(S)	6.9	(S)	10.1
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons--	(S)	105.1	(S)	119.4
331029	All other alloy steel mill shapes and forms----- do--	(S)	14.1	(S)	20.1
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons--	(S)	3.9	*7	1.8
331050	All other stainless steel mill shapes and forms ----- do--	(S)	3.6	(S)	4.9
	Copper and copper-base alloy:				
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- mil lb--	(S)	.8	(S)	.4
335143	Plate, sheet, and strip, including military cups and discs----- do--	(D)	(D)	(S)	.3
335003	All other ----- do--	(S)	.2	*1	4.3

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3545, MACHINE TOOL ACCESSORIES —Con.				
	Mill shapes and forms, except castings and forgings—Con.				
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	.7	(S)	.6
335405	Extruded shapes, including rod, bar, pipe, tube, etc. ----- do..	(S)	.7	(S)	.9
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	(S)	1.6	(S)	.2
335609	Nonferrous metal mill shapes and forms, except copper and aluminum -----	(X)	.8	(S)	2.7
329903	Industrial diamonds ----- carats..	(S)	14.2	(S)	9.2
	Metal powders:				
339916	Tungsten carbide ----- mil lb..	(S)	100.5	(S)	107.5
339919	All other ----- do..	(S)	7.1	(S)	17.3
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons..	(S)	1.8	(S)	.1
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	6.9	(S)	10.8
332045	Steel ----- do..	(S)	4.6	(S)	4.0
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	1.4	(S)	2.3
336006	Copper and copper-base alloy ----- do..	(S)	.2	(S)	.2
336008	Other nonferrous ----- do..	(Z)	(Z)	(S)	.5
346200	Iron and steel forgings ----- 1,000 s tons..	(S)	1.5	(S)	1.6
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	4.7	(X)	2.6
356201	Roller -----	(X)	1.7	(X)	1.1
359411	Hydraulic and pneumatic equipment, including pumps and compressors -----	(X)	4.9	(X)	2.6
360101	Electric transmission, distribution, and control equipment -----	(X)	30.4	(X)	5.3
329101	Grinding wheels and other abrasive products, except industrial diamonds -----	(X)	34.0	(X)	19.2
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	(X)	5.9	(X)	7.0
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses -----	(X)	1.5	(X)	(⁵)
320601	Ceramic and ceramic composite parts, components, and accessories -----	(X)	(D)	(X)	(⁵)
970099	All other materials and components, parts, containers, and supplies -----	(X)	171.2	(X)	⁵ 182.9
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	203.2	(X)	194.4
	INDUSTRY 3546, POWER-DRIVEN HANDTOOLS				
	Materials, parts, containers, and supplies -----	(X)	846.6	(X)	652.3
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	13.0	14.5	19.9
331012	Sheet and strip ----- do..	(S)	9.3	(S)	34.6
331006	All other carbon steel mill shapes and forms ----- do..	(S)			
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	10.7	(S)	9.1
331029	All other alloy steel mill shapes and forms ----- do..	(S)		(S)	5.8
335609	Nonferrous metal mill shapes and forms, except copper and aluminum ----- do..	(D)	(D)	(S)	1.0
335770	Magnet wire ----- mil lb..	*9.4	13.8	*7.2	10.1
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ----- do..	*3.2	11.3	(S)	6.8
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	1.4	(S)	3.4
332045	Steel ----- do..	**1.4	14.3	(S)	6.0
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	51.2	(S)	39.9
336003	Other nonferrous ----- do..	(S)	.1	(D)	59.5
346200	Iron and steel forgings ----- 1,000 s tons..	(D)	(D)	**3.4	4.0
	Electric motors and generators:				
362115	Fractional horsepower electric motors (less than 1 hp) (excluding timing motors) ----- thousands..	(S)	10.3	5 089.7	7.0
362120	Integral horsepower motors and generators (1 hp and larger) ----- do..	(D)	(D)	(D)	(⁹)
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	15.3	(X)	19.0
356201	Roller -----	(X)	3.5	(X)	3.6
356601	Speed changers, gears, and industrial high-speed drives -----	(X)	8.8	(X)	10.2
359411	Hydraulic and pneumatic equipment, including pumps and compressors -----	(X)	(D)	(X)	1.8
308006	Fabricated plastics products (except gaskets) -----	(X)	41.8	(X)	35.4
345001	Bolts, nuts, screws, fasteners, washers, rivets, and screw machine products -----	(X)	31.7	(X)	18.6
970099	All other materials and components, parts, containers, and supplies -----	(X)	441.9	(X)	³ 348.2
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	151.1	(X)	58.4

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982		
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)	
INDUSTRY 3547, ROLLING MILL MACHINERY						
Materials, parts, containers, and supplies -----		(X)	192.8	(X)	⁷ 187.3	
Mill shapes and forms, except castings and forgings:						
Carbon steel:						
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	1.8	**4.9	2.0	
331012	Sheet and strip ----- do..	(S)	(⁸)	.5	.2	
331013	Plates ----- do..	(S)	6.1	22.0	10.2	
331015	Structural shapes ----- do..	(S)	2.0	4.5	2.3	
331017	Wire and wire products ----- do..]	83.9	-	-	
331019	All other carbon steel mill shapes and forms ----- do..			.7	.5	
Alloy steel, except stainless:						
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	4.2]	(S)	5.6
331029	All other alloy steel mill shapes and forms ----- do..	(S)	.6			
331031	Stainless steel ----- do..	(S)	.1	(Z)		
335004	Copper and copper-base alloy ----- mil lb..	**1	.3	(Z)	9.2	
Aluminum and aluminum-base alloy:						
335301	Sheet, plate, and foil ----- mil lb..]	.6	(Z)	(Z)	
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..					
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	-	-	-	-	
335609	Nonferrous metal mill shapes and forms (except copper and aluminum) ----- do..	(Z)	(Z)	-	-	
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ----- do..	(D)	(D)	(Z)	(Z)	
329101	Grinding wheels and other abrasive products, except industrial diamonds ----- do..	(X)	.5	(X)	.5	
190023	Iron and steel scrap, excluding home scrap ----- 1,000 s tons..	(D)	(D)	(D)	(D)	
Castings (rough and semifinished):						
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	1.3	*2.7	2.9	
332045	Steel ----- do..	**1.4	2.6	*3.3	4.9	
336005	Aluminum and aluminum-base alloy ----- mil lb..	(Z)	(Z)	(Z)	(Z)	
336006	Copper and copper-base alloy ----- do..	(S)	.5	(S)	(⁹)	
336008	Other nonferrous ----- do..	(D)	(D)	-	-	
346200	Iron and steel forgings ----- 1,000 s tons..	**26.1	22.3	14.8	15.8	
349271	Fluid power (hydraulic and pneumatic) valves ----- do..	(X)	.7	(X)	1.1	
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies ----- do..	(X)	(D)	(X)	(D)	
Electric motors and generators:						
Fractional horsepower electric motors (less than 1 hp):						
362110	Timing motors, synchronous and subsynchronous ----- thousands..]	4.2	(D)	(D)	
362115	Other fractional horsepower electric motors (less than 1 hp) (excluding timing motors) ----- do..			-	-	
362120	Integral horsepower motors and generators (1 hp and larger) ----- do..			(S)	4.1	
Bearings, including mounted and unmounted:						
356218	Ball ----- do..	(X)	(D)	(X)	2.9	
356201	Roller ----- do..	(X)	1.7	(X)	9.3	
356601	Speed changers, gears, and industrial high-speed drives ----- do..	(X)	6.3	(X)	17.0	
Pumps (complete assemblies):						
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ----- thousands..	(D)	(D)	(S)	3.5	
356102	Other pumps ----- do..	(D)	(D)	(S)	1.1	
356301	Air and gas compressors ----- do..	(D)	(D)	(D)	(D)	
356921	Filters for hydraulic fluid power systems ----- do..	(X)	(Z)	(X)	.1	
359301	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators ----- do..	(X)	1.3	(X)	1.7	
359302	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) ----- do..	(X)	.4	(X)	(D)	
360101	Electric transmission, distribution, and control equipment ----- do..	(X)	.4	(X)	3.6	
265001	Paperboard containers, boxes, and corrugated paperboard ----- 1,000 s tons..	(X)	(D)	(Z)	(Z)	
305201	Rubber and plastics hose and belting ----- do..	(X)	.1	(X)	.1	
345001	Bolts, nuts, screws, washers, rivets, and screw machine products ----- do..	(X)	.6	(X)	1.0	
354501	Cutting tools for machine tools ----- do..	(X)	1.2	(X)	1.9	
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings ----- do..	(X)	(D)	(X)	(D)	
362520	Numerical controls for metalworking machinery (except programmable) ----- do..	(X)	-	(X)	(D)	
362521	Programmable controllers for metalworking machinery ----- do..	(X)	5.5	(X)	(D)	
970099	All other materials and components, parts, containers, and supplies ----- do..	(X)	72.5	(X)	³⁵ 1.6	
971000	Materials, parts, containers, and supplies, n.s.k. ² ----- do..	(X)	41.4	(X)	34.6	
INDUSTRY 3548, WELDING APPARATUS						
Materials, parts, containers, and supplies -----		(X)	¹⁰ 999.8	(NA)	(¹⁰)	
Mill shapes and forms, except castings and forgings:						
Carbon steel:						
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	8.7	(NA)	(NA)	
331012	Sheet and strip ----- do..	*84.0	48.0	(NA)	(NA)	
331013	Plates ----- do..	(S)	6.2	(NA)	(NA)	
331015	Structural shapes ----- do..	(S)	1.4	(NA)	(NA)	
331017	Wire and wire products ----- do..	222.8	80.6	(NA)	(NA)	
331019	All other carbon steel mill shapes and forms ----- do..	*10.0	4.3	(NA)	(NA)	
Alloy steel, except stainless:						
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	1.2	(NA)	(NA)	
331029	All other alloy mill shapes and forms ----- do..	(D)	(⁹)	(NA)	(NA)	
331031	Stainless steel ----- do..	(S)	10.2	(NA)	(NA)	
335001	Aluminum and aluminum-base alloy mill shapes and forms ----- mil lb..	(S)	20.7	(NA)	(NA)	
335004	Copper and copper-base alloy ----- do..	(S)	51.1	(NA)	(NA)	

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3548, WELDING APPARATUS—Con.					
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content)..... mil lb..	(S)	9.4	(NA)	(NA)
Castings (rough and semifinished):					
332001	Iron (gray and malleable) and steel 1,000 s tons..	(S)	2.5	(NA)	(NA)
336006	Copper and copper-base alloy mil lb..	(S)	8.4	(NA)	(NA)
336005	Other nonferrous do..	(S)	2.1	(NA)	(NA)
Electric motors and generators:					
Fractional horsepower electric motors (less than 1 hp):					
362110	Timing motors, synchronous and subsynchronous millions..	(S)	1.3	(NA)	(NA)
362115	Other fractional horsepower electric motors (excluding timing motors) thousands..	447.7	9.4	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp and larger) do..	(S)	.2	(NA)	(NA)
Bearings, including mounted and unmounted:					
356218	Ball (X)		3.4	(NA)	(NA)
356201	Roller (X)		.9	(NA)	(NA)
356601	Speed changers, gears, and industrial high-speed drives (X)		3.4	(NA)	(NA)
360101	Electric transmission, distribution, and control equipment (X)		12.6	(NA)	(NA)
265001	Paperboard containers, boxes, and corrugated paperboard ... 1,000 s tons..	(S)	12.3	(NA)	(NA)
305201	Rubber and plastics hose and belting (X)		4.3	(NA)	(NA)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products (X)		7.9	(NA)	(NA)
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings (X)		23.7	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies (X)		325.1	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ² (X)		240.5	(NA)	(NA)
INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.					
Materials, parts, containers, and supplies		(X)	10394.7	(NA)	(¹⁰)
Mill shapes and forms, except castings and forgings:					
Carbon steel:					
331011	Bars and bar shapes 1,000 s tons..	(S)	7.0	(NA)	(NA)
331012	Sheet and strip do..	(S)	2.1	(NA)	(NA)
331013	Plates do..	(S)	3.9	(NA)	(NA)
331015	Structural shapes do..	(S)	2.2	(NA)	(NA)
331017	Wire and wire products do..	(S)	.3	(NA)	(NA)
331019	All other carbon steel mill shapes and forms do..	(S)	3.6	(NA)	(NA)
Alloy steel, except stainless:					
331021	Bars and bar shapes 1,000 s tons..	(S)	3.9	(NA)	(NA)
331029	All other alloy steel mill shapes and forms do..	(S)	.5	(NA)	(NA)
331031	Stainless steel do..	(S)	.2	(NA)	(NA)
335004	Copper and copper-base alloy mil lb..	(S)	.1	(NA)	(NA)
Aluminum and aluminum-base alloy:					
335301	Sheet, plate, and foil mil lb..	(S)	2.4	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do..	(S)	6.3	(NA)	(NA)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do..	*.6	.9	(NA)	(NA)
335609	Nonferrous metal mill shapes and forms (except copper and aluminum) do..	(S)	.1	(NA)	(NA)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) do..	(S)	1.0	(NA)	(NA)
329101	Grinding wheels and other abrasive products, except industrial diamonds (X)		.4	(NA)	(NA)
190023	Iron and steel scrap, excluding home scrap 1,000 s tons..	-	-	(NA)	(NA)
Castings (rough and semifinished):					
332011	Iron (gray and malleable) 1,000 s tons..	(S)	4.1	(NA)	(NA)
332045	Steel do..	(S)	.9	(NA)	(NA)
336005	Aluminum and aluminum-base alloy mil lb..	(S)	4.7	(NA)	(NA)
336006	Copper and copper-base alloy do..	(S)	.3	(NA)	(NA)
336008	Other nonferrous do..	(S)	.3	(NA)	(NA)
346200	Iron and steel forgings 1,000 s tons..	(S)	.7	(NA)	(NA)
349271	Fluid power (hydraulic and pneumatic) valves (X)		2.9	(NA)	(NA)
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies (X)		1.1	(NA)	(NA)
Electric motors and generators:					
Fractional horsepower electric motors (less than 1 hp):					
362110	Timing motors, synchronous and subsynchronous thousands..	(S)	1.4	(NA)	(NA)
362115	Other fractional horsepower electric motors (less than 1 hp) (excluding timing motors) do..	(S)	1.5	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp and larger) do..	(S)	2.9	(NA)	(NA)
Bearings, including mounted and unmounted:					
356218	Ball (X)		1.8	(NA)	(NA)
356201	Roller (X)		1.2	(NA)	(NA)
356601	Speed changers, gears, and industrial high-speed drives (X)		6.1	(NA)	(NA)
Pumps (complete assemblies):					
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions thousands..	(S)	2.5	(NA)	(NA)
356102	Other pumps do..	*.8	.4	(NA)	(NA)
356301	Air and gas compressors do..	*.1	.3	(NA)	(NA)
356921	Filters for hydraulic fluid power systems (X)		.4	(NA)	(NA)
359301	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators (X)		2.3	(NA)	(NA)
359302	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) (X)		1.6	(NA)	(NA)

See footnotes at end of table.

Table 7. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3549, METALWORKING MACHINERY, N.E.C.—Con.				
360101	Electric transmissions, distribution, and control equipment	(X)	11.9	(NA)	(NA)
265001	Paperboard containers, boxes, and corrugated paperboard -- 1,000 s tons ..	(S)	.2	(NA)	(NA)
305201	Rubber and plastics hose and belting	(X)	.4	(NA)	(NA)
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	(X)	1.4	(NA)	(NA)
354501	Cutting tools for machine tools	(X)	1.6	(NA)	(NA)
362001	Electrical industrial capacitors, resistors, rheostats, and coil windings	(X)	1.2	(NA)	(NA)
362520	Numerical controls for metalworking machinery (except programmable)	(X)	1.6	(NA)	(NA)
362521	Programmable controllers for metalworking machinery	(X)	5.4	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies	(X)	116.2	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	182.8	(NA)	(NA)

¹For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

²Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

³Data are included with material code 970099 to avoid disclosing data for individual companies.

⁴For 1982, data for material code 335003 included only copper and copper-base alloy bare wire for electrical conduction and pipe and tube.

⁵For 1982, data for material codes 280020 and 320601 were not collected separately but were included with material code 970099.

⁶For 1982, data for copper and copper-base alloy castings (rough and semifinished) were included with material code 970099 to avoid disclosing data for individual companies.

⁷For 1982, total included data for copper and copper-base alloy rod, bar, and mechanical wire, including extruded and/or drawn shapes and pipe and tube and fabricated rubber products (except tires, tubes, hose, belting, and gaskets).

⁸For 1987, data for material code 331012 were combined with material code 331019 to avoid disclosing data for individual companies.

⁹For 1982, data included only copper and copper-base alloy plate, sheet, and strip, including military cups and discs.

¹⁰Industry definition is new for 1987; therefore, 1987 data for materials consumed are not comparable to prior-year data. As a result, 1982 materials consumed data are not available.

APPENDIX A.

Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies—As discussed in the Introduction, a separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the General Summary subject report.

Employment and related items—The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees—This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods.

Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers—This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees—This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual

industries shown in this report. They are included in the general summary and geographic area reports as a separate category.

Payroll—This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1987. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours—This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials—This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed—In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See the introduction for the importance of administrative records in the industry.)

Value of shipments—This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products—As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1987 census program, information was collected on the output of approximately 11,000 individual product items. The term "product", as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,600 of the product items were listed separately on the 1987 census report forms. Data for

about 4,400 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1987 for these items, as derived from the commodity surveys, are shown in the "products shipped" table (table 6a-2).

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1982 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products—To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Introduction, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1987 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, and the like. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments—The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the

addition of related industries representing successive stages in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the United States level and beginning in 1964, for all geographic levels.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures—For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to

manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

End-of-year inventories—Respondents were asked to report their 1986 and 1987 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

1. **Supplemental labor costs**—Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not

Because of this change in reporting instructions, the 1982 through 1987 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios—These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

As noted in the introduction, an establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

specifically required by legislation whether they were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans.

They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees. While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

2. **Retirements of depreciable assets**—Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1987. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.
3. **Depreciation charges for fixed assets**—This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.
4. **Rental payments**—Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

5. **Depreciable assets**—Total value of gross depreciable assets is collected on all census forms.

However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

6. **New and used capital expenditures**—The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)
7. **Quantity of electric energy consumed for heat and power**—Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the ASM forms. In addition, information was collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.
8. **Breakdown of new capital expenditures for machinery and equipment**—ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement.

Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

9. **Foreign content of cost of materials**—Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.

10. **Cost of purchased services**—ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, and communication services. Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding Census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed.

$$R_j = \frac{NM_c}{TME_{asm}}$$

where:

NM_c = the census value of new capital expenditures for machinery and equipment

TME_{asm} = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the three types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

APPENDIX B.

Annual Survey of Manufactures (ASM) Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The Annual Survey of Manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 56,000 manufacturing establishments selected from a total of about 220,000 establishments. These 220,000 establishments represent all manufacturing establishments of multiunit companies and all single establishment companies mailed schedules in the 1982 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1982 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

The 1984 through 1988 ASM sample differs slightly from the previous sample. For the current panel, all establishments of companies with 1982 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 56,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1982 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1982 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1982 Census of Manufactures. Although this portion contained approximately 130,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-record information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1983-1986 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1982 census published number for an item total and the linear ASM estimate of the total for 1982. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail establishments, to produce the estimates for the years 1983-1986. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

The 1987 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates, however, developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

APPENDIX C.

Changes in Census of Manufactures Product Classes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
30521	30411	30899 3089A	3079K pt	34919	34948	35483	36233
30522	30412			34921	3494B	35484	35496
30523	30413	32295	32291 pt	34922	3494C	35485	35495 pt 35497
30524	30414	32296	32292 pt	34923	3494D	35533	35531 pt
30525	30415	32297	32294 pt	34924	3494E	35534	35532 pt
30526	30416	32298	32291 pt 32292 pt 32294 pt	34925	3494F	35543	35541 35542 pt
30534	32934			34926	3494G		
30535	32935	32311	32317	34927	3494H	35544	35542 pt
30536	32936	32312	32317			35558	35557 pt
30537	32937	32927	32928 32929	3523C	35234 pt 35237 35238 pt	35561	35511
30538	32938	32961	32963 32965	3523E	35234 pt 35238 pt	35562	35512
30539	32939					35563	35513 pt
30611	3069A pt	32962	32964 32966	3523F	3523A 3523B	35591	35591 35699 pt
30612	3069A pt	33152	33152 34967	35246	35243 35245	35596	35595 pt
30613	3069A pt						
30614	3069B pt	33391	33331	3531A	35311	35597	35494
30615	3069B pt	33392	33334	3531B	35312	35599	35595 pt 36360 36362
30616	3069B pt	33398	33321 33323 33399	3531C	35317		
30617	3069B pt			3531E	35314 pt	35616	3561C
3069C	3069C 35557 pt	33561 33562 33563	33569	3531F	35316	35631	35631 pt
3069E	30310	33630	33611	3531G	35318 pt	35651	35513 pt 35514 pt 35691 pt
30810	30792	33640	33620 pt 33691 pt 33692 pt 33693 pt	3531H	35313 pt 35318 pt 35319 pt	35652	35513 pt 35514 pt 35691 pt
30820	3079K pt			3531K	35319 pt 35361 pt 35371 pt	35676	35672
30830	3079K pt	33650	33612				
30840	30794	33660	33620 pt	3531M	35313 pt 35314 pt 35319 pt 35372 pt	35692	35694 35695 35696
30850	30795	33690	33691 pt 33692 pt 33693 pt			35697 35698	35699 pt
30861 30862 30863 30864 30865 30866	30797			35337	35331 35332 pt	35711	35731 36629 pt
		34234	34232 pt	35338	35332 pt		
		34235	34232 pt 35531 pt 35532 pt	35339	35333	35712	35734 pt 35735 pt
30870	3079K pt			3533A	35335	35721	35732 pt
30880	3079J pt 3079K pt	34236	34233	3533B	35336	35722	35734 pt 35735 pt
30891	3079J pt 3079K pt	34441 34443 34447 34448 34449	34446	35363	35361 pt	35751	35732 pt 36612 pt
30892	3079J pt 3079K pt			35364	35362 pt		
		34461 34462 34463 34464 34465	34460	35373	35362 pt 35371 pt	35752	35734 pt 35735 pt
30893	3079J pt 3079K pt			35374	35362 pt 35372 pt	35771	35732 pt
30894	3079J pt 3079K pt	34696 34699	34699	3541D	35411 35412	35772	35734 pt 35735 pt
30895	3079J pt					35781	35743
30896	2499A pt 3079J pt 3079K pt	34911 34912 34913 34914 34915 34916	3494A	35430	35650	35782	35744
				35454	35453	35783	35745
				35455	35452		
30897	3079J pt 3079K pt	34917	34949	35481	36231	3585C	3585A 36993
30898	3079J pt 3079K pt	34918	34947	35482	36232	3585D	3585B 36994 pt

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product classes were revised for 1987. Listed below are the revisions to the product classes]

1987	1982	1987	1982	1987	1982	1987	1982
35931	35996 35997	36411	36410	36991—Con. 36995	36629 pt—Con.	38731—Con.	38734—Con. 38736 38737
35932	35998	36412	36994 pt	36997	35497 pt 36629 pt	39113 39114	39112
35933	35999	36520	36521 pt	36998	36994 pt	39153 39154	39151
35941	35617 35618 35631 pt	36613	35732 pt 36612 pt	3714A	37143		
35942	3561A 3561B 35631 pt	36614	36612 pt	37999	37994 37998	39447	36629 pt 39447
35961 35962 35963	35760	36631	36621 36629 pt	38121	38111	39493	39494 pt
		36632	36622	38122	36625 pt 36629	39495	3079k pt
36123 36126	36125	36691	36624	38210	38112 38113 pt	39496	39494 pt
36251	36138 pt 36794	36692	36626	38260	38320 38326	39523	39521 39522 pt
36252	36221	36693	36628	38271	38324	39524	39522 pt
36253	36222	36714	36711 36712	38272 38273	38325	39651	39630
36254	36138 pt 36223	36715	36799 pt	38295	36625 pt 38293	39654	39641
36330	36331 36333	36720	36797	38296	38113 pt	39656	39642
36395	36361 36394 36399	36799	36629 pt 36799 pt	38440	36931	39998	39620
		36950	35732 pt 36792	38450	36930 36933	39999	39995
		36991 36992	36629 pt	38731	38734	97372	36522
						97819	36521 pt

APPENDIX D.

Changes in Census of Manufactures

Product Codes for 1987

[Based on revisions to the Standard Industrial Classification (SIC) Manual, definitions of some product codes were revised for 1987. Listed below are the revisions to the product codes. The terms published and collected are defined as follows: (1) published refers to the code used in the published reports for 1987 and 1982, and (2) collected refers to the code appearing on the report forms for 1987]

1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
30118 00	30118 00	30118 19 30118 20	30539 77	32939 77	32939 77	30830 11 30830 13 30830 19	30793 01 30793 03 30793 09	3079K 90	30892 20— Con.	3079D 33— Con.	3079J 61 pt — Con. 3079J 66 pt 3079K 93 pt
3011A 39	3011A 39	3011A 33 3011A 35	30539 79	32939 79	32939 79						
			30539 81	32939 81	32939 81	30840 11	30794 21	30794 21			
3011C 29	3011C 29	3011C 24 3011C 26 3011C 27	30611 00	3069A 00	3069A 11	30840 12	30794 22	30794 22	30892 30	3079D 35	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
			30612 00	3069A 00	3069A 12 3069A 15	30840 13	30794 23	30794 23			
30521 00	30411 00	30411 00				30840 14	30794 24	30794 24			
30522 00	30412 00	30412 00	30613 00	3069A 00	3069A 13 3069A 14 3069A 16	30840 15	30794 25	30794 25	30892 90	3079D 39	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30523 00	30413 00	30413 00				30840 19	30794 26	30794 26			
30524 00	30414 00	30414 00	30614 00	3069B 00	3069B 11	30850 00	30795 00	30795 00			
30525 00	30415 00	30415 00	30615 00	3069B 00	3069B 12 3069B 13 3069B 14 3069B 19	30861 00	30797 41	30797 41			
30526 00	30416 00	30416 00							30893 00	3079F 22	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30534 11	32934 11	32934 11	30616 00	3069B 00	3069B 21	30862 10 30862 20 30862 90	30797 51 30797 53 30797 59	30797 42			
30534 13	32934 13	32934 13	30617 00	3069B 00	3069B 29						
30534 15	32934 15	32934 15	30697 77	30697 77	30697 11 30697 78	30863 10 30863 90	30797 61 30797 69	30797 44			
30534 17	32934 17	32934 17				30864 10 30864 20 30864 30 30864 90	30797 71 30797 73 30797 75 30797 79	30797 45	30894 01	30798 01	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 11	32935 11	32935 11	3069C 12	35558 72	35557 72						
30535 13	32935 13	32935 13	3069C 30	35558 76	35557 76						
30535 15	32935 15	32935 15	3069D 20	3069D 20	3069D 17 3069D 19	30865 10 30865 20 30865 30 30865 40 30865 90	30797 81 30797 83 30797 85 30797 86 30797 89	30797 46			
30535 17	32935 17	32935 17	3069D 42	3069D 42	3069D 55 3069D 58				30894 02	30798 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 19	32935 19	32935 19	3069E 20	30310 00	30310 00	30866 10	30797 43	30797 43			
30535 21	32935 21	32935 21				30866 90	30797 47	30797 47			
30535 23	32935 23	32935 23	30810 10	30792 11	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt	30870 12 30870 13	30791 01 30791 02	3079K 99	30894 03	30798 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30535 29	32935 29	32935 29				30880 00	3079F 20	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt			
30536 21	32936 21	32936 21									
30536 22	32936 22	32936 22	30810 20	30792 12	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt				30894 04	30798 04	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30536 25	32936 25	32936 25									
30536 26	32936 26	32936 26									
30536 30	32936 30	32936 30									
30536 35	32936 35	32936 35	30810 30	30792 13	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt				30894 05	30798 05	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30537 29	32937 29	32937 29									
30537 39	32937 39	32937 39									
30537 41	32937 41	32937 41	30810 40	30792 14	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt				30894 06	30798 06	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30537 43	32937 43	32937 43									
30537 49	32937 49	32937 49									
30538 10	32938 10	32938 10									
30538 13	32938 13	32938 13	30810 50	30792 19	30792 10 pt 30792 20 pt 30792 30 pt 30792 40 pt 30792 50 pt 30792 60 pt 30792 70 pt				30894 07	30798 07	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30538 15	32938 15	32938 15									
30538 17	32938 17	32938 17									
30538 19	32938 19	32938 19									
30539 70	32939 70	32939 70	30820 10 30820 20 30820 30 30820 40 30820 50 30820 60 30820 70 30820 80 30820 90	30796 01 30796 02 30796 03 30796 04 30796 05 30796 06 30796 07 30796 08 30796 19	3079K 80				30894 09	30798 09	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 93 pt
30539 73	32939 73	32939 73									
30539 75	32939 75	32939 75									
						30892 20	3079D 33	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt			
									30895 01	30799 01	3079J 61 pt

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30895 01— Con.	30799 01— Con.	3079J 61 pt —Con. 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 22— Con.	3079A 21— Con.	3079J 61 pt —Con. 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 05— Con.	3079B 25— Con.	3079J 61 pt —Con. 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 15	32927 15	32929 11 32929 21
									32927 31	32927 31	32929 31
									32927 33	32927 33	32929 33
30895 02	30799 02	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 23	3079A 23	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 06	3079B 26	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 34	32927 34	32929 34
									32927 36	32927 36	32929 36
									32927 41	32927 41	32929 41
									32927 77	32927 77	32929 77
30895 03	30799 03	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt	30896 24	3079A 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 07	3079B 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32927 78	32927 78	32929 51 32929 73 32929 75
									32927 98	32927 98	32928 13 32929 98
30896 11	3079A 11	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30896 25	3079A 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 08	3079B 28	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3079K 99 pt	32961 11	32961 11	32963 11 32965 11
									32961 31	32961 31	32963 31 32965 31
30896 12	3079A 12	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30896 26	3079A 28	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 09	3079B 29	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 94 pt 3179K 99	32961 35	32961 35	32963 35 32965 35
									32961 38	32961 38	32963 38 32965 38
									32961 51	32961 51	32963 51 32965 51
30896 13	3079A 13	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30896 27	2499A 94 3079A 29	2499A 94 3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt			3079J 66 pt 3079K 94 pt 3079K 99 pt	32961 61	32961 61	32963 61 32965 61
						30899 00	3079F 31	3079K 88	32961 98	32961 98	32963 98 32965 98
30896 14	3079A 14	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30897 01	3079F 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	3089A 11	3079F 41	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 31	32962 31	32964 31 32966 31
						3089A 12	3079F 43	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 34	32962 34	32964 34 32966 34
									32962 36	32962 36	32964 36 32966 36
30896 15	3079A 15	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30897 09	3079F 27	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 95 pt	3089A 14	3079F 47	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 45	32962 45	32964 45 32966 45
									32962 51	32962 51	32964 51 32966 51
30896 16	3079A 16	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 01	3079B 21	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 95 pt	3089A 18	3079F 49	3079K 93 pt 3079K 94 pt 3079K 95 pt 3079K 99 pt	32962 61	32962 61	32964 61 32966 61
						32295 00	32295 00	32291 00 pt	32962 83	32962 83	32964 83 32966 83
						32296 00	32296 00	32292 00 pt	32962 98	32962 98	32964 98 32966 98
30896 17	3079A 17	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 02	3079B 22	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	32297 00	32297 00	32294 00 pt	33121 98	33121 98	33121 79 33121 85 33121 98
						32298 00	32298 00	32291 00 pt 32292 00 pt 32294 00 pt	3312A 11 3312A 23 3312A 25 3312A 27	3312A 11 3312A 23 3312A 25 3312A 27	3312A 00
30896 18	3079A 18	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 03	3079B 23	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	32620 15	32620 15	32620 14 32620 52 pt	3312B 61 3312B 63 3312B 65 3312B 67	3312B 61 3312B 63 3312B 65 3312B 67	3312B 00
						32630 15	32630 15	32630 14 32630 52 pt	33151 22 33151 23	33151 22 33151 23	33151 21
30896 19	3079A 19	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 04	3079B 24	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	32630 19	32630 19	32630 18 32630 52 pt	33152 01	33152 01	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt
						32752 11	32752 11	32752 00	33152 03	33152 03	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt
30896 21	3079A 20	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt 3079J 65 pt 3079J 66 pt 3079K 99 pt	30898 05	3079B 25	3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt	32917 23	32917 23	32917 22 32917 24			
						32917 40	32917 40	32917 26 32917 28 32917 39			
30896 22	3079A 21	3079J 61 pt 3079J 62 pt			3079J 61 pt 3079J 62 pt 3079J 63 pt 3079J 64 pt	32927 14	32927 14	32928 15 32928 17			

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33152 03— Con.	33152 03— Con.	33152 11 pt —Con. 34967 19 pt	33157 42— Con.	33157 42— Con.	33157 31 pt —Con. 33157 71 pt	33561 66— Con. 33562 78 33563 91 33569 91	33561 66— Con. 33562 78 33563 91 33569 91	33569 92— Con.	34236 21	34236 21	34233 21
33152 05	33152 05	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 13 pt 34967 17 pt 34967 19 pt	33157 43	33157 43	33157 31 pt 33157 61 pt 33157 71 pt	33630 00	33611 00	33611 00	34236 31	34236 31	34233 31
			33159 44 33159 45 33159 48	33159 44 33159 45 33159 48	33159 49	33640 11	33620 42	33620 42	34236 41	34236 41	34233 41
						33640 21	33691 51	33691 51	34236 81	34236 81	34238 81
33152 07	33152 07	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33159 99	33159 99	33159 77 33159 98	33640 31	33692 31	33692 31	34236 99	34236 99	34233 99
			33211 21	33211 21	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33640 41	33693 71	33693 71	34292 12 34298 99	34292 12 34298 99	34298 98
						33640 51	33693 91	33693 91	34320 01 34320 03	34320 01 34320 03	34320 04
			33211 23	33211 23	33211 22 pt 33211 24 pt 33211 27 pt 33211 30 pt	33650 11	33612 11	33612 11	34320 05 34320 07	34320 05 34320 07	34320 06
33152 09	33152 09	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 25	33211 25	33211 33 pt 33211 36 pt 33211 39 pt 33211 42 pt	33650 31	33612 31	33612 31	34320 09 34320 11	34320 09 34320 11	34320 08
						33650 51	33612 51	33612 51	34320 14 34320 25 34320 35	34320 14 34320 25 34320 35	34320 98
33152 10	33152 10	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33211 26	33211 26	33211 33 pt 33211 36 pt 33211 39 pt 33211 42 pt	33650 61	33612 61	33612 61	34320 47 34320 48	34320 47 34320 48	34320 79
			33217 31	33217 31	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 20	33620 20	33620 20	34320 67 34320 69	34320 67 34320 69	34320 65
						33660 21	33620 21	33620 21	34320 71 34320 74 34320 75	34320 71 34320 74 34320 75	34320 98
33152 12	33152 12	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33217 33	33217 33	33217 32 pt 33217 34 pt 33217 37 pt 33217 40 pt	33660 22	33620 22	33620 22	34320 76 34320 78	34320 76 34320 78	34320 77
			33217 35	33217 35	33217 43 pt 33217 46 pt 33217 49 pt 33217 52 pt	33660 23	33620 23	33620 23	34320 80 34320 82	34320 80 34320 82	34320 55
						33660 24	33620 24	33620 24	34320 84 34320 86	34320 84 34320 86	34320 56
33152 14	33152 14	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33217 36	33217 36	33217 43 pt 33217 46 pt 33217 49 pt 33217 52 pt	33660 25	33620 25	33620 25	34320 87 34320 88	34320 87 34320 88	34320 98 pt
						33660 31	33620 31	33620 31	34320 90 34320 91	34320 90 34320 91	34320 40
			33252 11	33252 11	33252 12 33252 13	33660 72	33620 72	33620 72	34320 92 34320 93	34320 92 34320 93	34320 42
						33690 11	33691 61	33691 61	34320 94 34320 95	34320 94 34320 95	34320 43
33152 16	33152 16	33152 11 pt 33152 13 pt 33152 17 pt 33152 19 pt 34967 11 pt 34967 13 pt 34967 17 pt 34967 19 pt	33391 00	33331 00	33331 00	33690 15	33692 11	33692 11	34320 96 34320 97	34320 96 34320 97	34320 44
			33392 31	33334 31	33334 31	33690 21	33692 33	33692 33	34320 99	34320 99	34320 98 pt
			33392 37	33334 37	33334 35 pt	33690 25	33692 41	33692 41	34432 44	34432 44	34432 45
33152 22	33152 22	33152 33 pt 34967 23 pt	33392 39	33334 39	33334 38 pt	33690 91 33690 98	33693 94 33693 99	33693 99	34432 46 34432 48	34432 46 34432 48	34432 47
33152 23	33152 23	33152 23 34967 19 pt	33392 41	33334 41	33334 41	33991 91 33991 98	33991 91 33991 98	33991 99	34432 52 34432 54 34432 56 34432 98	34432 52 34432 54 34432 56 34432 98	34432 99
33152 25	33152 25	33152 25 34967 21	33392 43	33334 43	33334 45 pt	34234 11	34234 11	34232 31	34433 13	34433 13	34433 12 34433 14 34433 48 pt
			33392 49	33334 49	33334 48 pt	34234 22	34234 22	34232 83	34433 17	34433 17	34433 16 34433 18 34433 48 pt
33152 30	33152 30	33152 33 pt 34967 23 pt	33392 51	33334 51	33334 35 pt 33334 38 pt 33334 45 pt 33334 48 pt	34234 33	34234 33	34232 85	34433 22	34433 22	34433 21 34433 23 34433 48 pt
33156 15	33156 15	33156 13	33392 55	33334 55	33334 55	34234 44 34234 98	34234 44 34234 98	34232 99	34433 32	34433 32	34433 31 34433 33 34433 48 pt
33156 17	33156 17		33392 55	33334 55	33334 55	34235 11	34235 11	34232 53	34433 38	34433 38	34433 45
33156 22	33156 22	33156 21	33398 01	33321 00	33321 00	34235 31	34235 31	34232 54	34433 39	34433 39	34433 48 pt
33156 24	33156 24		33398 05	33323 00	33323 00	34235 39	34235 39	34232 56	34433 49	34433 49	
33157 21	33157 21	33157 31 pt 33157 61 pt 33157 71 pt	33398 73	33398 73	33399 85	34235 11	34235 11	34232 53	34433 50	34433 50	
33157 22	33157 22	33157 31 pt 33157 61 pt 33157 71 pt	33398 99	33398 99	33398 23 33398 98 33399 81	34235 21	34235 21	34232 56	34433 13	34434 13	34434 12 pt
33157 23	33157 23	33157 31 pt 33157 61 pt 33157 71 pt	33416 99	33416 99	33416 51 33416 98	34236 11	34236 11	34233 11	34434 15	34434 15	34434 18 pt
33157 41	33157 41	33157 31 pt 33157 61 pt 33157 71 pt	33542 61	33542 61	33542 51 pt 33542 53 pt						
33157 42	33157 42	33157 31 pt 33157 61 pt	33542 63	33542 63	33542 51 pt 33542 53 pt						
			33561 66	33561 66	33569 92						

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34434 17	34434 17	34434 12 pt	34463 12	34463 12	34460 46	34913 35	3494A 45	3494A 45	34931 57	34931 57	34931 56 34931 58
34434 19	34434 19	34434 18 pt	34463 20 34463 22	34463 20 34463 22	34460 49	34913 47	3494A 46	3494A 46	34931 99	34931 99	34931 63 34931 98
34435 21	34435 21	34435 20	34464 10	34464 10	34460 54 pt 34460 56 pt	34913 59	3494A 47	3494A 47	34932 10 34932 20	34932 10 34932 20	34932 00
34435 23	34435 23					34913 61	3494A 49	3494A 49	34944 21	34944 21	34944 11
34435 31	34435 31	34435 35	34464 13	34464 13	34460 54 pt 34460 56 pt	34914 11	3494A 51	3494A 51	34944 31 34944 41	34944 31 34944 41	34944 19
34435 33	34435 33					34914 15	3494A 53	3494A 53	34944 51 34944 99	34944 51 34944 99	
34435 37	34435 37	34435 38	34464 16	34464 16	34460 54 pt 34460 56 pt	34914 13	3494A 52	3494A 52	34945 12 34945 14	34945 12 34945 14	34945 98
34435 39	34435 39					34914 17	3494A 54	3494A 54	34945 16 34945 17	34945 16 34945 17	
34438 03	34438 03	34438 04	34464 18	34464 18	34460 54 pt 34460 56 pt	34914 21	3494A 55	3494A 55	34961 22 34961 31	34961 22 34961 31	34961 21
34438 05	34438 05					34914 23	3494A 56	3494A 56	34961 31	34961 31	
34438 14	34438 14	34438 15	34465 10	34465 10	34460 54 pt	34914 25	3494A 57	3494A 57	34964 41	34964 41	34964 31 pt 34964 61 pt 34964 99 pt
34438 16	34438 16					34914 31	3494A 58	3494A 58	34964 43	34964 43	34964 31 pt 34964 61 pt 34964 71 pt 34964 99 pt
34438 17	34438 17	34438 18	34465 12	34465 12	34460 56 pt	34915 11	3494A 61	3494A 61	34964 61 pt 34964 71 pt 34964 99 pt	34964 61 pt 34964 71 pt 34964 99 pt	
34438 19	34438 19					34915 23	3494A 63	3494A 63	34964 45	34964 45	34964 31 pt 34964 61 pt 34964 99 pt
34439 15	34439 15	34439 21	34465 30	34465 30	34460 62	34915 35	3494A 65	3494A 65	34966 23 34966 25	34966 23 34966 25	34966 13
34439 17	34439 17					34915 47	3494A 67	3494A 67	34966 27 34966 29	34966 27 34966 29	34966 21
34439 19	34439 19		34482 11	34482 11	34482 17 34482 27	34916 11	3494A 31	3494A 31	34968 45 34968 46 34968 47	34968 45 34968 46 34968 47	34968 49
34439 31	34439 31	34439 30				34916 61	3494A 69	3494A 69	34968 81 34968 83 34968 85	34968 81 34968 83 34968 85	34968 98
34439 32	34439 32		34625 11 34625 13 34625 15 34625 17	34625 11 34625 13 34625 15 34625 17	34625 00	34916 23	3494A 32	3494A 32	34992 13	34992 13	34992 12 34992 19
34439 33	34439 33					34916 31	3494A 33	3494A 33	34995 21	34995 21	34995 13 34995 15
34439 34	34439 34		34626 11 34626 13 34626 15 34626 17	34626 11 34626 13 34626 15 34626 17	34626 00	34916 33	3494A 34	3494A 34	34998 25 34998 99	34998 25 34998 99	34998 98
34439 51	34439 51	34439 56				34916 41	3494A 35	3494A 35	35111 01 35111 02	35111 01 35111 02	35111 00
34439 53	34439 53		34692 20 34692 88 34692 98	34692 20 34692 88 34692 98	34692 99	34916 53	3494A 36	3494A 36	35112 00	35112 00	35112 00 pt
34441 21	34441 21	34446 37				34916 65	3494A 38	3494A 38	35112 21	35112 21	35112 01 pt 35112 15 35112 16
34441 23	34441 23	34446 36	34790 10 34790 11 34790 21	34790 10 34790 11 34790 21	34790 19	34917 11	3494A 71	3494A 71	35112 22	35112 22	35112 01 pt 35112 17
34441 27	34441 27	34446 34				34917 13	34949 13	34949 13	35112 23	35112 23	35112 08 35112 18
34441 29	34441 29	34446 32	34790 73 34790 75	34790 73 34790 75	34790 71	34917 15	34949 15	34949 15	35112 24	35112 24	35112 09 35112 19
34443 11	34443 11	34446 21				34917 27	34949 27	34949 21 34949 23 34949 25			
34443 13	34443 13		34911 11	3494A 11	3494A 11	34917 31	34949 31	34949 31			
34443 21	34443 21	34446 25				34917 39	34949 39	34949 39			
34443 23	34443 23		34911 21	3494A 12	3494A 12	34917 88	34949 98	34949 98			
34447 21	34447 21	34446 47				34918 00	34947 00	34947 00			
34447 25	34447 25	34446 46	34911 23	3494A 13	3494A 13	34919 00	34948 00	34948 00			
34447 31	34447 31	34446 11				34921 00	3494B 00	3494B 00			
34447 41	34447 41	34446 51	34911 34	3494A 14	3494A 14	34922 00	3494C 00	3494C 00			
34448 11	34448 11	34448 62 pt				34923 00	3494D 00	3494D 00			
34448 13	34448 13	34446 64 pt	34911 38	3494A 15	3494A 15	34924 00	3494E 00	3494E 00			
34448 19	34448 19					34925 00	3494F 00	3494F 00			
34449 31	34449 31	34446 15	34911 43	3494A 17	3494A 17	34926 00	3494G 00	3494G 00			
34449 41	34449 41	34446 62 pt 34446 64 pt				34927 00	3494H 00	3494H 00			
34449 53	34449 53	34446 44	34912 01	3494A 21	3494A 21						
34449 55	34449 55	34446 42									
34449 62	34449 62	34446 62 pt	34912 11	3494A 22	3494A 22						
34449 65	34449 65	34446 64 pt									
34449 88	34449 98	34446 98	34912 21	3494A 23	3494A 23						
34461 10	34461 10	34460 07									
34461 12	34461 12	34460 09	34912 31	3494A 25	3494A 25						
34461 15	34481 15	34460 12									
34461 17	34461 17	34460 17	34912 35	3494A 26	3494A 26						
34462 10	34462 10	34460 31									
34462 12	34462 12	34460 36	34912 41	3494A 27	3494A 27						
34462 22	34462 22	34460 22									
34462 26	34462 26	34460 51	34912 43	3494A 29	3494A 29						
34463 10	34463 10	34460 41									

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35112 74	35112 74	35112 75 pt	3531E 00	3531E 00	35314 00 pt	35337 22 35337 23	35337 22 35337 23	35331 41	35364 03	35364 03	35362 09 35362 15 pt
35112 76	35112 76	35112 75 pt 35112 77	3531F 00	3531F 00	35316 00	35337 24 35337 25	35337 24 35337 25	35331 46	35364 04	35364 04	35362 11 35362 15 pt
35112 79 35112 83	35112 79 35112 83	35112 00 pt	3531G 00	3531G 00	35318 00 pt	35337 26 35337 27	35337 26 35337 27	35331 43	35364 05	35364 05	35362 13 35362 15 pt
35199 01	35199 01	35199 98 pt	3531H 00	3531H 00	35313 00 pt 35318 00 pt 35319 85	35337 44	35337 44	35331 44	35364 06	35364 06	35362 14 35362 15 pt
35199 33	35199 26	35199 26	3531K 06	3531K 06	35319 06	35337 45	35337 45	35331 45	35364 17	35364 17	35362 55 pt
35199 41 35199 42	35199 41 35199 42	35199 03	3531K 07	3531K 07	35319 07	35337 47	35337 47	35331 47	35364 52	35364 52	35362 52
35199 43 35199 44	35199 43 35199 44	35199 04	3531K 11	3531K 11	35319 11	35337 48	35337 48	35331 48	35364 54	35364 54	35362 55 pt
35199 45 35199 46	35199 45 35199 46	35199 05	3531K 20	3531K 20	35319 20	35337 59	35337 59	35331 59	35373 01 35373 02	35373 01 35373 02	35371 23 pt
35199 47	35199 47	35199 06 pt 35199 07 pt	3531K 22 3531K 24	3531K 22 3531K 24	35319 23	35338 31	35338 31	35332 31	35373 03	35373 03	35371 11 pt
35199 48	35199 48	35199 06 pt 35199 07 pt	3531K 25	3531K 25	35319 25	35338 51	35338 51	35332 51	35373 05	35373 05	35371 36 pt 35371 37 pt 35371 38 pt
35199 51 35199 52	35199 51 35199 52	35199 14	3531K 27	3531K 27	35319 27	35338 55	35338 55	35332 55	35373 06	35373 06	35371 36 pt 35371 37 pt 35371 38 pt
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35199 55 35199 56	35199 55 35199 56	35199 16	3531K 61	35363 36	35361 36	35338 99	35338 99	35332 61 pt	35373 12	35373 12	35371 61
35199 57 35199 58	35199 57 35199 58	35199 17	3531K 70	3531K 70	35319 70	35339 12	35339 12	35333 12	35373 15	35373 15	35371 23 pt 35371 41 pt
35199 59 35199 60	35199 59 35199 60	35199 18	3531K 74	3531K 74	35319 72 35319 73	35339 19	35339 19	35333 19	35373 16	35373 16	35371 11 pt
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35199 92	35199 92	35199 22 pt 35199 23 pt 35199 28 pt 35199 29 pt 35199 98 pt	3531K 90	3531K 40 35373 90	35319 41 35371 91 35371 93	35339 55	35339 55	35333 55	35373 19	35373 19	35371 65
35239 26	35239 26	35239 21 35239 25	3531K 97	3531K 97	35319 97	35339 57	35339 57	35333 57	35373 21	35373 21	35371 55
35239 31	35239 31	35239 01 35239 02 35239 03 35239 04 35239 05 35239 06 35239 07 35239 08 35239 09 35239 11 35239 12 35239 19 35239 30	3531M 01	3531M 01	35313 00 pt	35339 61	35339 61	35333 61	35373 25	35373 25	35371 99 pt
35239 53	35239 53	35239 50 35239 51	3531M 03	3531M 03	35314 00 pt	35339 65	35339 65	35333 65	35373 26	35373 26	35371 75
3523C 00	3523C 00	35234 00 pt 35237 00 35238 00 pt	3531M 05	3531M 05	35319 84 pt 35319 86 pt	35339 71	35339 71	35333 71	35373 28	35373 28	35371 81
3523E 00	3523E 00	35234 00 pt 35238 00 pt	3531M 07	3531M 07	35319 84 pt 35319 86 pt	35339 82	35339 82	35333 82	35373 29	35373 29	35371 83
3523F 00	3523F 00	3523A 00 3523B 00	3531M 09	3531M 09	35319 84 pt 35319 86 pt	35339 98	35339 98	35333 98	35373 31	35373 31	35371 71
35246 00	35246 00	35243 00 35245 00	3531M 15	3531M 19	35319 84 pt 35319 86 pt 35374 15 35372 85 pt	3533A 10	3533A 10	35335 10	35373 32	35373 32	35371 85
3531A 00	3531A 00	35311 00	35329 33	35329 33	35329 31 pt 35329 35 pt	3533B 21	3533B 21	35336 21	35373 35	35364 41	35362 41
3531B 00	3531B 00	35312 00	35329 34	35329 34	35329 31 pt 35329 35 pt	3533B 32	3533B 32	35336 31	35373 39	35373 39	35371 48 35371 99 pt
3531C 00	3531C 00	35317 10 35317 20 35317 30	35363 01 35363 02 35363 03	35363 01 35363 02 35363 03	35361 11	35363 13	35363 13	35361 13	35374 11	35374 11	35372 11
			35363 15	35363 15	35361 14	35363 16	35363 16	35361 16	35374 17	35364 57	35362 57
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			35337 12	35337 12	35331 12	35363 37 35363 38	35363 37 35363 38	35361 39 pt	35421 00	35421 00	35421 10 35421 20
			35337 14	35337 14	35331 14	35363 45	35363 45	35361 45	35424 01 35424 02	35424 01 35424 02	35424 11
			35337 15	35337 15	35331 15	35364 01	35364 01	35362 07 35362 15 pt	35424 03 35424 04 35424 05	35424 03 35424 04 35424 05	35424 75
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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
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35441 23 35441 25	35441 23 35441 25	35441 29				35485 01	35497 61	35497 61	35543 04	35543 04	35541 25 35542 73 pt
35441 42 35441 44 35441 83 35441 89	35441 42 35441 44 35441 83 35441 89	35441 91				35485 02	35497 65	35497 65			
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35442 16	35442 16	35442 25 pt				35485 05	35497 74	35497 63 35497 75	35543 11	35543 11	35541 49 pt 35542 73 pt
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			35481 02	36231 16	36231 16	35492 13 35492 18	35492 13 35492 18	35492 19	35543 13	35543 13	35541 45 35542 73 pt
35442 41 35442 42	35442 41 35442 42	35442 33	35481 03	36231 31	36231 31	35495 01 35495 02 35495 03	35495 01 35495 02 35495 03	35495 10	35543 14	35543 14	35541 49 pt 35542 73 pt
35442 45 35442 47 35442 67	35442 45 35442 47 35442 67	35442 62 pt	35481 04	36231 32	36231 32	35495 92 35495 95	35495 92 35495 95	35495 98	35543 15	35543 15	35541 41 35541 43 35541 49 pt 35542 73 pt
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35454 14	35454 14	35453 14	35481 08	36231 53	36231 53	35521 68 35521 69	35521 68 35521 69	35521 67	35543 24	35543 24	35541 54 pt 35541 59 pt 35542 73 pt
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35454 45	35454 45	35453 45	35482 04	36232 23	36232 23	35533 25 35533 27	35533 25 35533 27	35531 75 pt	35544 05	35544 05	35542 87
35454 51	35454 51	35453 51	35482 05	36232 25	36232 25	35533 29	35533 29	35531 98 pt	35551 02	35551 02	35551 01 35551 03 35551 05 35551 08
35454 59	35454 59	35453 59	35482 06	36232 31	36232 31	35533 31	35533 31	35531 73 pt	35553 05	35553 05	35553 01 35553 02 35553 04
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35455 15	35455 15	35452 15	35482 12	36232 54	36232 54	35534 01 35534 02 35534 03	35534 01 35534 02 35534 03	35532 21	35558 69	35558 69	35557 69
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35455 21	35455 21	35452 21	35482 14	36232 58	36232 58	35534 11	35534 11	35532 81 pt	35558 85	35558 85	35557 85
35455 61	35455 61	35452 61	35482 15	36232 62	36232 61 36232 65	35543 01	35543 01	35541 11 35542 73 pt	35561 02	35511 02	35511 41 pt 35511 99 pt
35455 65	35455 65	35452 65	35482 16	36232 66	36232 64 pt 36232 68 pt	35543 02	35543 02	35541 21 35541 27 35542 73 pt	35561 05	35511 05	35511 73
35455 71	35455 71	35452 71	35483 05	36233 13	36233 13				35561 06	35511 06	35511 83
35455 81 35455 83	35455 81 35455 83	35452 99 pt	35483 06	36233 23	36233 23						
35455 91 35455 92	35455 91 35455 92	35452 92	35483 07	36233 31	36233 31						
35455 93	35455 93	35452 99 pt	35483 08	36233 52	36233 52						
35455 94	35455 94	35452 94	35483 09	36233 61	36233 61						
35455 95	35455 95	35452 95	35483 11	36233 71	36233 71						
35455 96 35455 97 35455 98	35455 96 35455 97 35455 98	35452 99 pt	35483 19	36233 81	36233 81						
			35484 01	35496 01	35496 01						
			35484 02	35496 05	35496 05						
			35484 03	35496 09	35496 09						
			35484 04	35496 15	35496 15						
			35484 05	35496 17	35496 17						

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
35561 07	35511 07	35511 91	35593 01	35593 11	35593 11	35599 13	35599 13	35595 41 pt 35595 98 pt	35616 00	35616 00	3561C 00
35561 08	35511 08	35511 99 pt	35593 03	35593 31	35593 31	35599 15	35599 15	35595 41 pt 35595 98 pt	35645 46 35645 47	35645 46 35645 47	35645 49
35561 09	35511 09	35511 41 pt	35593 05	35593 32	35593 32	35599 17	35599 17	35595 41 pt 35595 98 pt	35646 10 35646 20	35646 10 35646 20	35646 00
35561 11	35511 11	35511 99 pt	35593 07	35593 34	35593 34	35599 19	35599 19	35595 41 pt 35595 98 pt	35651 01	35514 15 35691 15	35514 15 35691 15
35561 19	35511 19		35593 09	35593 35	35593 35	35599 22	35599 22	35595 41 pt 35595 98 pt	35651 02	35514 22 35691 22	35514 22 35691 22
35561 21	35511 21		35593 11	35593 52	35593 52	35599 25	35599 25	35595 41 pt 35595 98 pt	35651 03	35514 26 35691 26	35514 26 35691 26
35562 11	35512 11	35512 11	35593 13	35593 13	35593 53 35593 54	35599 27	35599 27	35595 41 pt	35651 04	35514 29 35691 29	35514 29 35691 29
35562 21	35512 21	35512 21	35593 15	35593 61	35593 61	35599 29	35599 29	35595 41 pt	35651 05	35514 30 35691 30	35514 30 35691 30
35562 31	35512 31	35512 31	35593 17	35593 71	35593 71	35599 31	35599 31	35595 45	35651 06	35514 32 35691 32	35514 32 35691 32
35562 41	35512 41	35512 41	35593 19	35593 72	35593 72	35599 33	35599 33	35595 49	35651 07	35514 33 35691 33	35514 33 35691 33
35562 51	35512 51	35512 51	35593 21	35593 21	35593 79	35599 35	35599 35	35595 43	35651 08	35514 35 35691 35	35514 35 35691 35
35562 65	35512 65	35512 61 35512 92 pt	35593 23	35593 23		35599 37	35599 37	35595 52	35651 09	35514 41 35691 41	35514 41 35691 41
35562 71	35512 71	35512 71	35593 25	35593 25		35599 41	35599 41	35595 82 pt	35651 11	35514 52 35691 52	35514 52 35691 52
35562 75	35512 75	35512 75	35593 27	35593 27	35593 81	35599 43	35599 43	35595 86 pt	35651 12	35514 53 35691 53	35514 53 35691 53
35562 85	35512 85	35512 92 pt	35593 28	35593 28		35599 45	35599 45	35595 87	35651 13	35514 54 35691 54	35514 54 35691 54
35562 91	35512 91	35512 87 35512 92 pt	35593 29	35593 29		35599 47	35599 47	35595 92	35651 14	35514 55 35691 55	35514 55 35691 55
35563 01	35513 01	35513 59 pt	35594 01	35594 11	35594 11	35599 49	35599 49	35595 96	35651 15	35514 63 35691 63	35514 63 35691 63
35563 02	35513 02	35513 39	35594 03	35594 31	35594 31	35599 51	35599 51	35595 82 pt	35651 16	35514 71 35691 71	35514 71 35691 71
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35563 04	35513 04		35594 07	35594 71	35594 71	35599 55	35599 55	35595 88 pt	35651 18	35514 82 35691 82	35514 82 35691 82
35563 05	35513 05	35513 23 pt 35513 59 pt	35594 09	35594 09	35594 79	35599 57	35599 57	35595 89	35651 19	35514 83 35691 83	35514 83 35691 83
35563 06	35513 06	35513 52 35513 59 pt	35594 13	35594 13		35599 73	35599 73	35595 94	35651 21	35514 84 35691 84	35514 84 35691 84 pt
35563 07	35513 07	35513 59 pt	35594 15	35594 15		35599 75	35599 75	35595 98 pt	35651 22	35514 85 35691 85	35513 67 35691 84 pt
35563 08	35513 08	35513 49	35594 17	35594 17	35594 81	35599 77	35599 77	35595 98 pt	35652 00	35514 91 35691 91	35513 83 pt 35514 91 35691 91
35563 09	35513 09	35513 59 pt	35594 19	35594 19		35599 79	35599 79	35595 98 pt	35674 01	35674 01	35674 11 pt
35563 11	35513 11	35513 13	35596 01	35596 01	35595 95	35599 80	35599 80	35595 98 pt	35674 02	35674 02	35674 17
35563 12	35513 12	35513 23 pt 35513 59 pt	35596 03	35596 03		35599 82	35599 82	35595 98 pt	35674 03	35674 03	35674 19 pt 35674 31 pt
35563 14	35513 14	35513 59 pt	35596 05	35596 05		35599 83	35599 83	35595 98 pt	35674 04	35674 04	35674 11 pt 35674 19 pt 35674 31 pt
35563 15	35513 15	35513 29 35513 59 pt	35596 07	35596 07		35599 85	35599 85	35595 98 pt	35675 01	35675 01	35675 51
35563 21	35513 21	35513 83 pt	35596 09	35596 09		35599 86	35599 86	35595 98 pt	35675 02	35675 02	35675 59
35591 01	35591 01	35591 00 pt	35596 11	35596 11		35599 87	35599 87	35595 98 pt	35675 03	35675 03	35675 91
35591 03	35591 03		35596 13	35596 13		35599 88	35599 88	35595 98 pt	35675 11	35675 11	35675 91
35591 05	35591 05		35596 15	35596 15		35599 89	35599 89	35595 98 pt	35676 00	35676 00	35672 00 pt
35591 07	35591 07	35591 00 pt 35698 33	35596 17	35596 17		35599 90	35599 90	35595 98 pt	35676 01	35676 01	35672 11
35591 09	35591 09	35591 00 pt 35699 97 pt	35596 19	35596 19		35599 92	35599 92	35595 98 pt			
35591 11	35591 11		35596 21	35596 21		35599 93	35599 93	35595 98 pt			
35591 13	35591 13	35591 00 pt 35698 34	35596 23	35596 23		35599 94	35599 94	35595 98 pt			
35591 15	35591 15	35591 00 pt	35596 25	35596 25		35599 95	35599 95	35595 98 pt			
35592 01	35592 21	35592 21	35596 27	35596 27		35599 96	35599 96	35595 98 pt			
35592 03	35592 33	35592 33	35596 29	35596 29		35599 97	35599 97	35595 98 pt			
35592 05	35592 35	35592 35	35596 31	35596 31							
35592 07	35592 54	35592 54	35596 33	35596 33							
35592 09	35592 09	35592 98 pt	35596 35	35596 35							
35592 11	35592 11		35596 37	35596 37							
35592 15	35592 15	35592 41 35592 42 35592 98 pt	35596 39	35596 39							
35592 19	35592 97	35592 97	35596 41	35596 41							
			35596 43	35596 43							
			35596 45	35596 45							
			35596 47	35596 47							
			35596 49	35596 49							
			35596 51	35596 51							
			35597 01	35494 01	35494 01						
			35597 02	35494 03	35494 03						
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			35599 03	35599 03							
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35676 05	35676 05	35672 41 pt	35771 00	35732 30 35732 61	35732 00 pt	35893 08 35893 09	35893 08 35893 09	35893 98	36122 02 36122 04 36122 06 36122 14 36122 16 36122 19 36122 21 36122 23 36122 28 36122 29	36122 02 36122 04 36122 06 36122 14 36122 16 36122 19 36122 21 36122 23 36122 28 36122 29	36122 00			
35676 06	35676 06	35672 00 pt		35772 00	35733 30 35733 60				35734 30 pt 35735 51 pt 35734 30 pt 35735 51 pt	35921 01	35921 01	35921 11		
35676 17 35676 19	35676 17 35676 19	35672 41 pt								35921 02	35921 02	35921 13		
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35683 98	35683 98	35683 91 35683 99 pt										35783 00	35745 00	35745 10 35745 31
			3579A 00	3579A 00	3579A 20 3579A 40 3579A 41 3579A 44 3579A 50 3579A 55	35922 02	35922 02	35922 23	36123 01 36123 02 36123 03 36123 04 36123 05 36123 06 36123 07 36123 11	36123 01 36123 02 36123 03 36123 04 36123 05 36123 06 36123 07 36123 11	36125 00 pt			
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35692 00	35692 00	35694 00 35695 00 35696 00										35922 04	35922 04	35922 53
35693 04	35693 04	35693 01 pt 35693 02 pt 35693 03 pt	35820 35 35820 36	35820 35 35820 36	35820 24	35922 05	35922 05	35922 55	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36126 01 36126 02 36126 03 36126 04 36126 05 36126 09	36125 00 pt			
						35922 06	35922 06	35922 57						
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35698 01 35698 02	35698 01 35698 02	35699 31	3585D 20	3585B 20	3585B 20	35933 00	35999 00	35999 00	36249 94 36249 96	36249 94 36249 96	36249 98			
35698 03 35698 04	35698 03 35698 04	35699 32	3585D 30	3585B 30	3585B 30	35941 10	35619 00	35617 00 35618 00						
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35698 07 35698 08	35698 07 35698 08	35699 35	3585D 60	3585B 60	3585B 60	35942 20	35631 60	35631 40 pt	36252 00	36221 00	36221 00			
35698 11 35698 12	35698 11 35698 12	35699 36	3585D 70	3585B 70	3585B 70	35961 01	35761 01	35760 13	36253 00	36222 00	36222 00			
			3585D 80	3585B 72 36994 07	3585B 72 36994 07									
35698 13 35698 14	35698 13 35698 14	35699 41	35860 89	35860 89	35860 21 35860 41 35860 88	35961 03	35761 03	35760 15	36291 01	36291 11	36291 11			
35698 15 35698 16	35698 15 35698 16	35699 43				35961 05	35761 05	35760 21						
35698 17 35698 18	35698 17 35698 18	35699 45				35961 07	35761 07	35760 23						
35698 21 35698 22	35698 21 35698 22	35699 51	35892 03	35892 03	35892 01 pt	35961 09	35761 09	35760 24	36291 03	36291 31	36291 31			
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35698 23 35698 24	35698 23 35698 24	35699 61	35892 06	35892 06	35892 01 pt 35892 02 pt	35961 13	35761 13	35760 28	36291 09	36291 09	36291 98 pt			
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35698 27 35698 28	35698 27 35698 28	35699 73	35892 27	35892 27	35892 93 pt	35962 01	35762 01	35760 32						
35698 31 35698 32	35698 31 35698 32	35699 74	35892 43	35892 43	35892 61 35892 89 pt	35962 03	35762 03	35760 33	36311 10 36311 20	36311 10 36311 20	36311 00			
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35698 35 35698 36 35698 48 35698 49	35698 35 35698 36 35698 48 35698 49	35699 97 pt	35892 45 35892 76	35892 45 35892 76	35892 93 pt	35962 07	35762 07	35760 37 pt	36313 10 36313 20	36313 10 36313 20	36313 00			
35711 00	35731 00 36629 43	35731 00 36629 00 pt	35892 77	35892 77	35892 84	35962 09	35762 09	35760 41	36314 10 36314 20	36314 10 36314 20	36314 00			
			35892 78 35892 79	35892 78 35892 79	35962 11	35762 11	35760 45							
			35892 80	35892 80	35892 93 pt	35962 13	35762 13	35760 52						
35712 00	35733 05	35734 20 35735 41	35892 80	35892 80	35892 93 pt	35962 15	35762 15	35760 53	36330 10	36330 10	36330 00 36333 11 36333 15 36333 71			
35721 00	35732 10	35732 00 pt	35892 85 35892 87 35892 88	35892 85 35892 87 35892 88	35892 86	35962 17 35962 19	35762 17 35762 19	35760 37 pt						
35722 00	35733 10	35734 30 pt 35735 51 pt	35892 91	35892 91	35892 93 pt	35963 01	35763 01	35760 61	36349 20	36349 20	36349 13 36349 18 36349 88 36349 89			

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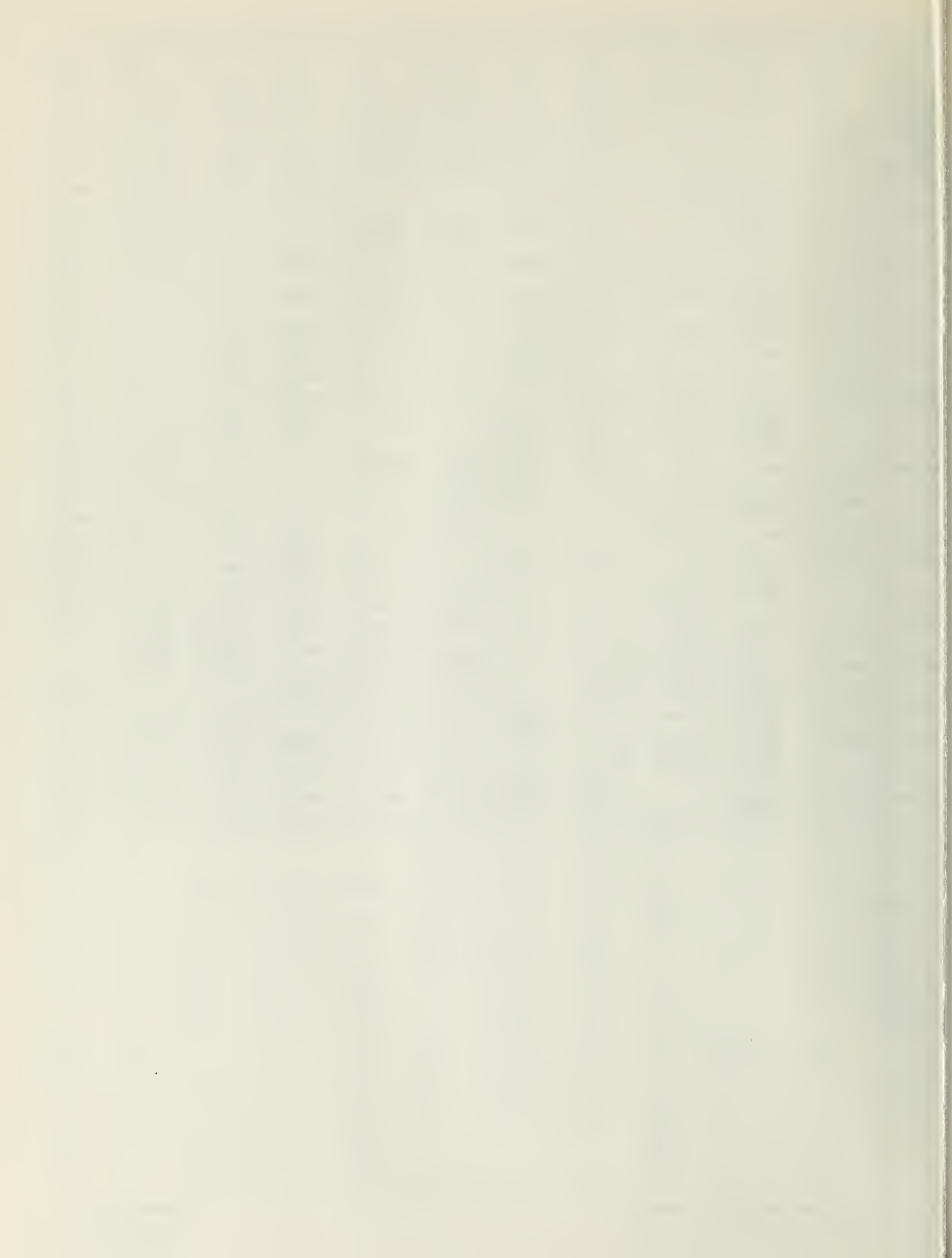
1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
36395 10	36361 21 36395 30	36361 21 36394 00 pt 36399 60	36920 05— Con.	36920 05— Con.	36920 10 pt —Con. 36920 82 pt 36920 92 pt	37112 02— Con.	37112 02— Con.	37112 23 pt —Con. 37112 26 pt	37131 07	37131 07	37131 60 pt
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36489 12	36489 12	36489 11 pt 36489 19 pt	36941 03	36941 03	36941 31				37131 43	37131 30	37131 30
			36941 04	36941 04	36941 35				37131 49	37131 49	37131 12 pt 37131 25
36489 16	36489 16	36489 11 pt	36942 01	36942 01	36942 14 36942 28 pt				37131 53	37131 33	37131 33
36489 17	36489 17	36489 19 pt				37112 07	37112 07	37112 11 pt 37112 13 pt 37112 15 pt	37131 55	37131 34	37131 34
36520 00	36520 00	36521 00 36521 19	36942 02	36942 02	36942 28 pt				37131 57	37131 54	37131 54
			36942 03	36942 03	36942 27 36942 28 pt	37112 08	37112 08	37112 23 pt 37112 25 pt 37112 26 pt	37131 61	37131 36	37131 36
36520 01	36520 01	36521 01 pt 36521 02 pt							37131 62	37131 38	37131 38
36520 03	36520 03	36521 01 pt 36521 02 pt	36942 04	36942 04	36942 37 36942 41 36942 42	37112 09	37112 09	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 63	37131 56	37131 56
36520 05	36520 05	36521 03 36521 04	36943 01	36943 01	36943 11 36943 42 pt				37131 69	37131 69	37131 60 pt
36520 07	36520 07	36521 05	36943 02	36943 02	36943 42 pt				37132 01	37132 79	37132 79
36520 09	36520 09					37112 31	37112 31	37112 11 pt 37112 13 pt 37112 15 pt	37132 02	37132 02	37132 71 37132 75
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			36947 04 36947 05	36947 04 36947 05	36947 03	37112 32	37112 32	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 05	37132 05	
36520 19	36520 19	36521 11 36521 13 36521 14 36521 16	36949 07	36949 07	36949 09 pt				37132 06	37132 06	
			36949 11	36949 11	36949 02				37132 07	37132 07	
36613 00	35732 50 36612 20	35732 00 pt 36612 00 pt	36949 12	36949 12	36949 03 36949 04	37112 33	37112 33	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 08	37132 08	
36614 00	36612 40	36612 00 pt							37132 09	37132 09	
36631 00	36621 00 36629 41	36621 00 36629 00 pt	36949 13	36949 13	36949 05 36949 06				37132 15	37132 15	
			36949 19	36949 19	36949 09 pt				37132 16	37132 16	
36632 00	36622 00	36622 00				37112 34	37112 34	37112 26 pt	37132 17	37132 17	
36691 00	36624 00	36624 00	36950 00	35732 20 36792 00	35732 00 pt 36792 00	37112 35	37112 35	37112 11 pt 37112 13 pt 37112 15 pt	37132 18	37132 18	
36692 00	36626 00	36626 00	36991 00	36629 10 36629 45	36629 00 pt				37132 19	37132 19	
36693 00	36628 00	36628 00				37112 36	37112 36	37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 21	37132 21	
36714 00	36714 00	36711 00 36712 00	36992 00	36629 20	36629 00 pt				37132 25	37132 77	37132 77
			36995 00	36629 30	36629 00 pt				37132 26	37132 26	37132 98 pt
36715 00	36799 10	36799 00 pt	36997 00	35497 65 36629 47 36629 50	35497 65 36629 00 pt	37112 39	37112 39	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37132 27	37132 27	
36720 00	36797 00	36797 00							37132 28	37132 28	
36799 20	36799 20 36629 42	36629 00 pt 36799 00 pt	36998 01	36994 51	36994 51				37132 29	37132 29	
			36998 02	36994 71	36994 71				37132 31	37132 31	
36799 30	36799 30	36799 00 pt	36998 03	36994 72	36994 96 pt				37142 48	37142 48	37142 03 37142 04 37142 05 37142 22 37142 33 37142 37 37142 49
36913 17	36913 17	36913 15 36913 16	36998 04	36994 82	36994 82	37113 01	37113 01	37113 13 pt 37113 15 pt	37144 09	37144 09	37144 11 37144 13
36914 25	36914 25	36914 21 36914 29	36998 05	36994 83	36994 83	37113 02	37113 02	37113 13 pt 37113 15 pt	37146 03	37146 03	37146 01 37146 02
36915 01	36915 01	36915 72 36915 75	36998 06	36994 84	36994 84				37146 49	37146 49	37146 19 37146 21 37146 39
			36998 07	36994 85	36994 85	37113 03	37113 21	37113 21	37147 07	37147 07	37147 03 37147 09
36915 02	36915 02	36915 85	36998 19	36994 97	36994 81 36994 96 pt	37131 01	37131 51	37131 51	37148 03	37148 03	37148 04 37148 05
36920 01	36920 01	36920 10 pt 36920 70 pt 36920 82 pt	37112 01	37112 01	37112 11 pt 37112 13 pt 37112 15 pt 37112 17 pt 37112 21 pt 37112 23 pt 37112 25 pt 37112 26 pt	37131 02	37131 02	37131 60 pt	37148 27	37148 27	37148 29 37148 31
36920 03	36920 03	36920 70 pt 36920 82 pt				37131 03	37131 03	37131 12 pt 37131 44 pt	37149 20	37149 20	37149 21 37149 29 pt
36920 04	36920 04	36920 70 pt 36920 82 pt				37131 04	37131 04	37131 12 pt 37131 44 pt	37149 39	37149 39	37149 14 37149 15 37149 18 37149 19 37149 24 37149 26 37149 29 pt
36920 05	36920 05	36920 10 pt 36920 70 pt	37112 02	37112 02	37112 23 pt 37112 25 pt	37131 06	37131 58	37131 58			

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1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published	1987 published	1987 collected	1982 published
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3714A 02	3714A 02	37143 21				37433 04	37433 69	37433 69	38122 00	36625 30 36629 44	36625 00 pt 36629 00 pt
3714A 03	3714A 03	37143 23				37433 11	37433 71	37433 71	38210 10	38112 00	38112 00
3714A 04	3714A 04	37143 26	37322 25	37322 25	37322 48	37433 12	37433 12	37433 79	38210 20	38113 20	38113 00 pt
3714A 05	3714A 05	37143 49 pt	37322 27 37322 28	37322 27 37322 28	37322 55 pt	37433 13	37433 13		38244 00	38244 00	38244 11 38244 21 38244 31 38244 99
3714A 06	3714A 06					37433 14	37433 14				
3714A 07	3714A 07	37143 44	37322 29	37322 29	37322 53 37322 55 pt 37322 61	37511 01	37511 11	37511 11			
3714A 08	3714A 08	37143 49 pt				37511 02	37511 21	37511 21	38260 00	38326 00	
3714A 09	3714A 09	37143 46	37323 03	37323 03	37323 11 pt 37323 30	37511 03	37511 31	37511 31	38271 00	38324 00	38324 00
3714A 10	3714A 10	37143 47	37323 05	37323 05	37323 11 pt 37323 35	37511 04	37511 42	37511 42	38272 00	38325 30	38325 00
3714A 11	3714A 11	37143 48				37511 05	37511 44	37511 44	38273 00	38325 40	
3714A 12	3714A 12	37143 49 pt	37323 07	37323 07	37323 11 pt 37323 50	37511 06	37511 51	37511 51	38295 10	38293 00	38293 00
3714A 13	3714A 13		37323 09	37323 09	37323 11 pt 37323 54	37511 09	37511 59	37511 59	38295 20	36625 20	36625 00 pt
3714A 19	3714A 19										
37151 00	37151 00	37151 10 37151 50	37323 13	37323 13	37323 11 pt 37323 56	37511 10	37511 10	37511 71	38296 00	38113 10	38113 00 pt
37152 01	37152 01	37152 00				37511 12	37511 12		38411 42	38411 42	38411 41 38411 45 38411 46
37152 02	37152 02		37323 15	37323 15	37323 11 pt 37323 58	37511 13	37511 13				
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37211 00	37211 00	37211 21 37211 23 37211 28	37511 15	37511 15		37511 16	37511 16				
			37511 19	37511 19		37512 01	37512 01	37512 14 37512 17	38411 85	38411 85	38411 82 38411 83
37244 01	37244 01	37244 13	37323 17	37323 17	37323 11 pt 37323 70 37323 75	37512 06	37512 06	37512 53	38411 87	38411 87	38411 84 pt
37244 02	37244 02					37512 07	37512 07		38411 97	38411 97	38411 98 pt
37244 05	37244 05	37244 53	37323 19	37323 19	37323 00 pt	37612 01	37612 25	37612 25			
37244 06	37244 06								37324 01	37324 01	37324 10 37324 15
37311 01	37311 01	37311 11 pt 37311 21	37324 03	37324 03	37324 18 pt 37324 20 pt 37324 25 pt	37612 02	37612 02	37612 35 37612 45	38421 01	38421 01	38421 99 pt
37311 02	37311 02	37311 11 pt 37311 31				37614 01	37614 13	37614 13			
37311 03	37311 03	37311 11 pt 37311 41	37324 05	37324 05	37324 18 pt 37324 20 pt 37324 25 pt	37614 02	37614 02	37614 15 37614 17	38421 02	38421 02	38421 35 pt
37311 04	37311 04	37311 11 pt 37311 51				37615 01	37615 11	37615 11	38421 03	38421 03	38421 99 pt
37311 05	37311 05	37311 11 pt 37311 61	37324 07	37324 07	37324 18 pt 37324 20 pt 37324 25 pt	37615 02	37615 13	37615 13	38421 04	38421 04	38421 11 pt
37311 06	37311 06	37311 81 pt				37615 03	37615 03	37615 15 37615 23	38421 05	38421 41	38421 41
37311 07	37311 07	37311 75	37324 09	37324 09	37324 18 pt 37324 20 pt 37324 25 pt	37922 61 37922 63 37922 69	37922 61 37922 63 37922 69	37922 59	38421 06	38421 38	38421 38
37311 09	37311 09	37311 11 pt 37311 81 pt							37922 01	37922 01	37922 22 37922 25 pt 37922 32 37922 35 pt
37313 21	37313 21	37313 98 pt	37327 03	37327 03	37327 25 pt 37327 28 pt 37327 35 pt 37327 38 pt	37950 01	37950 01	37950 15	38421 08	38421 82	38421 82
37313 29	37313 29	37313 10 37313 12 37313 14 37313 98 pt							37996 01	37996 30	37996 30
37316 01	37316 01	37316 13 37316 53	37327 05	37327 05	37327 28 pt 37327 38 pt	37996 02	37996 32	37996 32	38421 10	38421 45	38421 45
37316 02	37316 02	37316 19 37316 59							37996 03	37996 34	37996 34
37322 01	37322 01	37322 03 37322 04 37322 06 37322 08	37327 07	37327 07	37327 28 pt 37327 38 pt	37996 04	37996 36	37996 36	38421 37	38421 37	38421 33 38421 34
37322 02	37322 02	37322 11							37996 08 37996 09	37996 08 37996 09	37996 39
37322 05	37322 05	37322 19 pt	37327 09	37327 09	37327 28 pt 37327 38 pt	37999 01	37999 01	37994 92	38421 97	38421 97	38421 15 38421 99 pt
37322 07	37322 07								37999 02	37999 02	37994 94
37322 09	37322 09	37322 15	37327 19	37327 19	37327 42 37327 49	37999 03	37999 03	37998 62	38423 21 38423 22 38423 23 38423 24	38423 21 38423 22 38423 23 38423 24	38423 31
37322 11	37322 11	37322 19 pt							37999 04	37999 04	37998 64
37322 13	37322 13	37322 17 37322 19 pt	37431 11	37431 72	37431 72	37999 19	37999 19	37998 35 37998 51 37998 82 37998 84 37998 86 37998 90	38440 00	36931 00	36931 00
37322 21	37322 21	37322 40 37322 42 37322 44							37431 12 37431 15 37431 17 37431 18	37431 12 37431 15 37431 17 37431 18	37431 79
			37433 01	37433 41	37433 41	37999 21	37999 21	37998 88	38511 18 38511 19	38511 18 38511 19	38511 17
			37433 02	37433 61	37433 61				38517 04 38517 05	38517 04 38517 05	38517 09

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38517 04— Con. 38517 06 38517 07 38517 10 38517 11	38517 04— Con. 38517 06 38517 07 38517 10 38517 11	38517 09— Con.	38731 06	38731 06	38737 01	39153 11	39153 11	39151 13 pt	39610 65— Con. 39610 71	39610 65— Con. 39610 71	39610 72— Con.
			38731 07	38731 07	38737 02 38737 03	39153 12	39153 12	39151 31 pt			
			38731 11	38731 11	38737 19	39153 21 39153 31	39153 21 39153 31	39151 41 39151 51 pt	39610 93 39610 95	39610 93 39610 95	39610 91
38611 11	38611 11	38611 12 38611 14	38731 13	38731 13	38736 39	39154 00	39154 11	39151 13 pt 39151 31 pt 39151 51 pt	39651 01	39630 11	39630 11
38611 69	38611 69	38611 67 38611 68	38732 01	38732 01	38732 10 38732 22	39314 24 39314 25	39314 24 39314 25	39314 23	39651 09	39630 15	39630 15
38611 91	38611 91	38611 81	38732 02	38732 02	38732 14 38732 24	39443 46	39443 46	39443 44 39443 45	39651 11	39630 41	39630 41
38611 98	38611 98	38611 43 38611 99	38732 03	38732 03	38732 16 38732 26	39443 47 39443 98	39443 47 39443 98	39443 99	39651 19	39630 51	39630 51
38613 17	38613 17	38613 27 38613 46	38732 09	38732 09	38732 18 38732 20 38732 29 38732 30	39447 16	36629 46	36629 00 pt	39651 21	39630 61	39630 61
38613 89	38613 89	38613 98				39447 16	36629 46	36629 00 pt	39651 29	39630 98	39630 98
						39493 01	39493 01	39494 62	39654 22	39641 22	39641 22
38613 97	38613 97	38613 61	39113 11	39113 11	39112 11 pt	39493 02	39493 02	39494 63	39654 23	39641 23	39641 23
38615 01	38615 01	38615 11 38615 17 38615 32 38615 37	39113 21	39113 21	39112 21 pt	39493 05	39493 05	39495 99 pt	39654 31	39641 31	39641 31
			39113 31	39113 31	39112 31 pt	39495 05	39495 05	39495 99 pt	39654 33	39641 33	39641 33
38615 02	38615 02	38615 63	39113 41	39113 41	39112 41 pt	39495 72	39495 72	39495 78 39495 79	39654 39	39641 39	39641 39
			39113 98	39113 98	39112 98 pt	39495 81 39495 88 39495 89	39495 81 39495 88 39495 89	39495 99 pt	39656 20	39642 20	39642 20
38615 03	38615 03	38615 73 38615 74	39114 11	39114 11	39112 11 pt	39495 92	39495 92	39495 90 pt	39656 21	39642 21	39642 21
38615 04	38615 04	38615 75	39114 21	39114 21	39112 21 pt	39495 93	39495 93	39495 91 pt	39656 32	39642 32	39642 32
38615 05	38615 05	38615 57 38615 64 38615 65 38615 76 38615 81	39114 31	39114 31	39112 31 pt	39495 96	39495 96	39495 90 pt 39495 91 pt	39656 33	39642 33	39642 33
			39114 41	39114 41	39112 41 pt	39495 98	39495 98	39495 99 pt	39656 51	39642 51	39642 51
38619 00	38619 00	38619 41 38619 43 38619 45	39114 51 39114 61 39114 71	39114 51 39114 61 39114 71	39112 98	39496 01	39496 01	39494 65	39656 71	39642 71	39642 71
38731 01	38731 01	38734 11 38734 12 38736 11	39141 41 39141 43 39141 69	39141 41 39141 43 39141 69	39141 66	39496 02	39496 02	39494 68	39656 81	39642 81	39642 81
						39496 03 39496 04	39496 03 39496 04	39494 70	39656 89	39642 89	39642 89
38731 02	38731 02	38734 22 pt 38736 13 pt	39142 35	39142 35	39142 34 39142 36	39496 05	39496 05	39494 69	39656 91	39642 91	39642 91
38731 03	38731 03	38734 21 38734 22 pt 38736 12 38736 13 pt	39142 41 39142 43	39142 41 39142 43	39142 61	39496 06	39496 06	39494 70 pt	39656 99	39642 99	39642 99
38731 05	38731 05	38736 31 38736 32 38736 33	39142 55	39142 55	39142 54 39142 56	39523 00	39523 00	39521 00 39522 15	39656 99	39642 99	39642 99
			39142 69	39142 69	39142 61 pt	39524 13	39524 13	39522 13	39656 99	39642 99	39642 99
						39524 19	39524 19	39522 19	39656 99	39642 99	39642 99
						39610 65	39610 65	39610 72	39656 99	39642 99	39642 99



PUBLICATION PROGRAM

1987 CENSUS OF MANUFACTURES

Publications of the 1987 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

Preliminary Reports

Industry series—83 reports (MC87-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the U.S. and States are released in one report.

Final Reports

Industry series—83 reports (MC87-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

Geographic area series—51 reports (MC87-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MSA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MSA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

Subject series—7 reports (MC87-S-1 to -7)

Each of the seven reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, type of organization, water use in manufacturing, textile machinery in place, distribution of sales by class of customer, manufacturers' shipments to the Federal Government, and a general national-level summary.

Reference series—1 report (MC87-R-1)

The Numerical List of Manufactured and Mineral Products includes a description of the principal products and services published in the 1987 Censuses of Manufactures and Mineral Industries.

Location of Manufacturing Plants—1 report (MC87-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and zip codes for each State. (This report is available only on magnetic tape and CD-ROM.)

Analytical Reports—3 reports (AR87-1 to -3)

Exports From Manufacturing Establishments (AR87-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

Selected Characteristics of Manufacturing Establishments That Export (AR87-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

Indexes of Production (AR87-3)

The indexes presented in this report are designed to measure the change in physical output of each manufacturing and mineral industry between 1982 and 1987.

MICROFICHE

Every final published report in the 1987 Census of Manufactures will be available on microfiche.

PUBLIC-USE COMPUTER TAPES AND COMPACT DISCS

Data from the final industry series, geographic area series, and the Location of Manufacturing Plants report will be available on public-use computer tapes and compact discs-read only memory (CD-ROM). These tapes will provide the same information found in the final reports. Computerized data products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, DC 20233.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, service industries, construction industries, mineral industries, transportation, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1987 Economic Censuses. A separate series of reports covers the censuses of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services (Publications), Bureau of the Census, Washington, DC 20233.

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